

DIESEL PROGRESS

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DECEMBER, 1941

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DIESEL PROGRESS for December, 1941. Volume VII, Number 12. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth Street, New York, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1934, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: United States and Possessions \$3.00. Canada and all other countries \$5.00 per year. Single copy price 25 cents in U. S. A., 50 cents for all other countries.

DIESEL and GAS ENGINE PROGRESS



REX W. WADMAN
Editor and Publisher

FRONT COVER ILLUSTRATION: Diesels replaced steam on the Chicago and North Western's famous "400" trains in October, 1939. The equipment consists of two 2-unit locomotives, each locomotive having two 2,000 hp. General Motors Diesels. These locomotives haul ten-car trains between Chicago and the Twin Cities at an average speed of 63 miles per hour, including five intermediate stops.

TABLE OF CONTENTS ILLUSTRATION: Almost amphibious, this monster swamp dumper was developed by Mack Trucks, Inc., for the Gatun section of the Third Lock Project of the Panama Canal. Sixteen of these huge trucks were built for this project. They weigh 60,000 lbs. loaded with 12 cu. yds. of earth and are powered with 150 hp. Diesels.

DIESEL PROGRESS for December, 1941, Vol. VII, No. 12. Published monthly by Diesel Engines, Inc., 2 West 45th Street, New York, N. Y. Tel. Murray Hill 2-7333. Subscription rates: U. S. & A. and Possessions, \$3.00 per year; 25c per copy. All other countries, \$5.00 per year; 50c per copy.

HEYWORTH CAMPBELL
Art Director

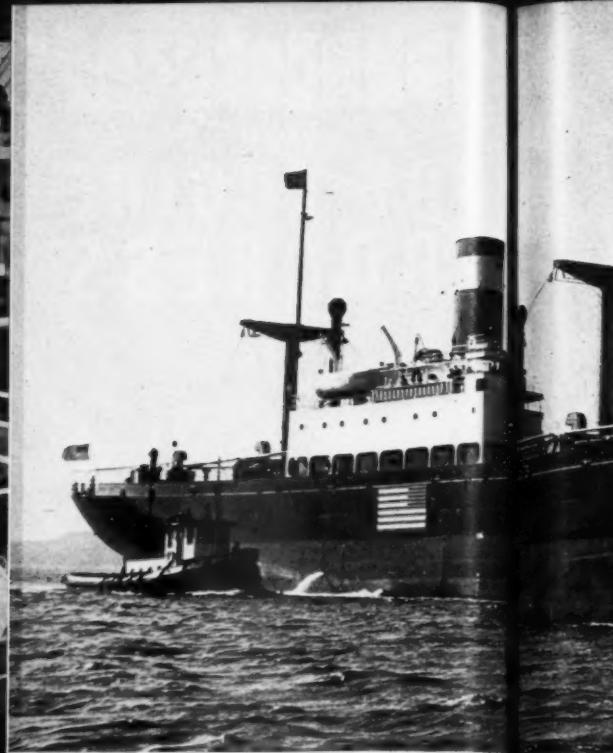


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The "Oregon" breaking Seat

FIRST FIVE

SCHEDULED

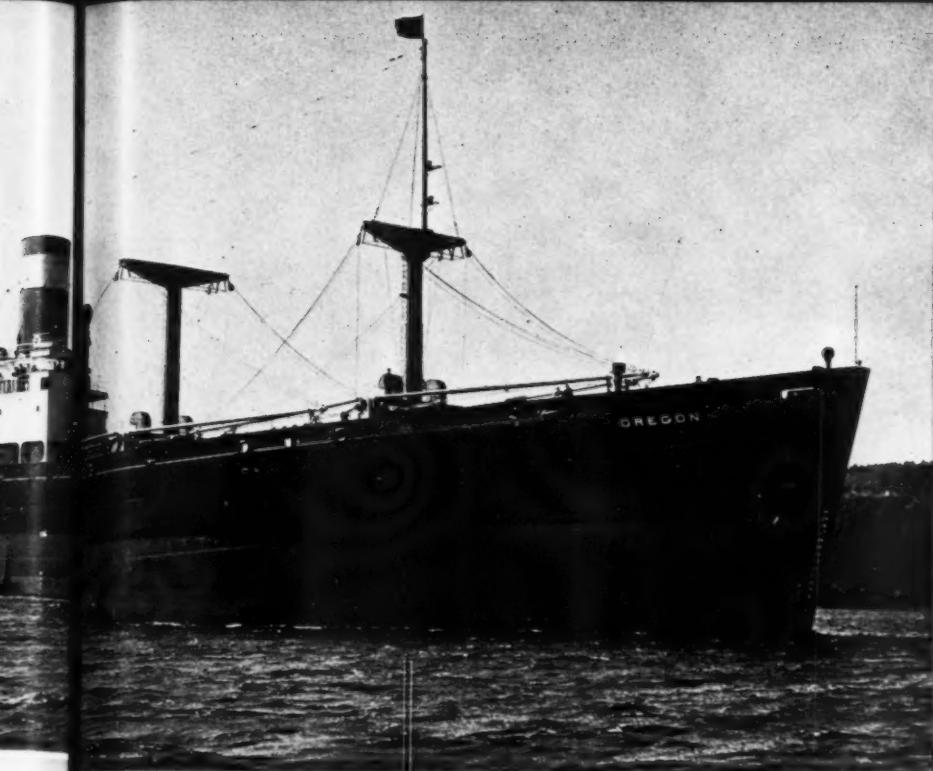
BEFORE April 8 and September 9, the first five large ocean going vessels completed on Puget Sound in the past seventeen years were delivered to their owners by the big Tacoma plant of Seattle-Tacoma Shipbuilding Corporation. Identical as to dimensions and power, these vessels represent a speedy completion of the five finest Diesel-equipped ships ever built on the Pacific Coast, and a creditable wind-up of the first \$11,000,000 contract to be undertaken by the newly organized and expanded Todd yard. Almost coincident with the deliv-

ery of the fourth of these five vessels, the Tacoma plant was ordered to expand its facilities 400% to a full-size eight-way yard capable of turning out the largest ships ever built and, with the publication of this article, the Tacoma yard will emerge as one of the largest shipyards on the Pacific Coast, 7,000 employed, and eight large ships on the ways.

This is important, for the successful completion of the five Type C-1-B, 100% Dieselize ships won for the yard its reputation and a proved

guarantee that no contract for ship construction was too complicated or too large for it to undertake. It was also significant that the last of the five ships was delivered scarcely twenty-two months from the time the bare tidelands shipyard site was laid out to become a full-fledged shipbuilding plant. Twenty-two months from weeds to a \$11,000,000 contract fulfillment, a decidedly commendable record.

The first of the ships, *Cape Alava*, was a pace setter, and into its roomy insides went the



The "Oregon" and the "Idaho" were fourth and fifth ships completed on the record breaking Seattle-Tacoma schedule.

FIVE DIESEL SHIPS COMPLETED ON DUE TACOMA

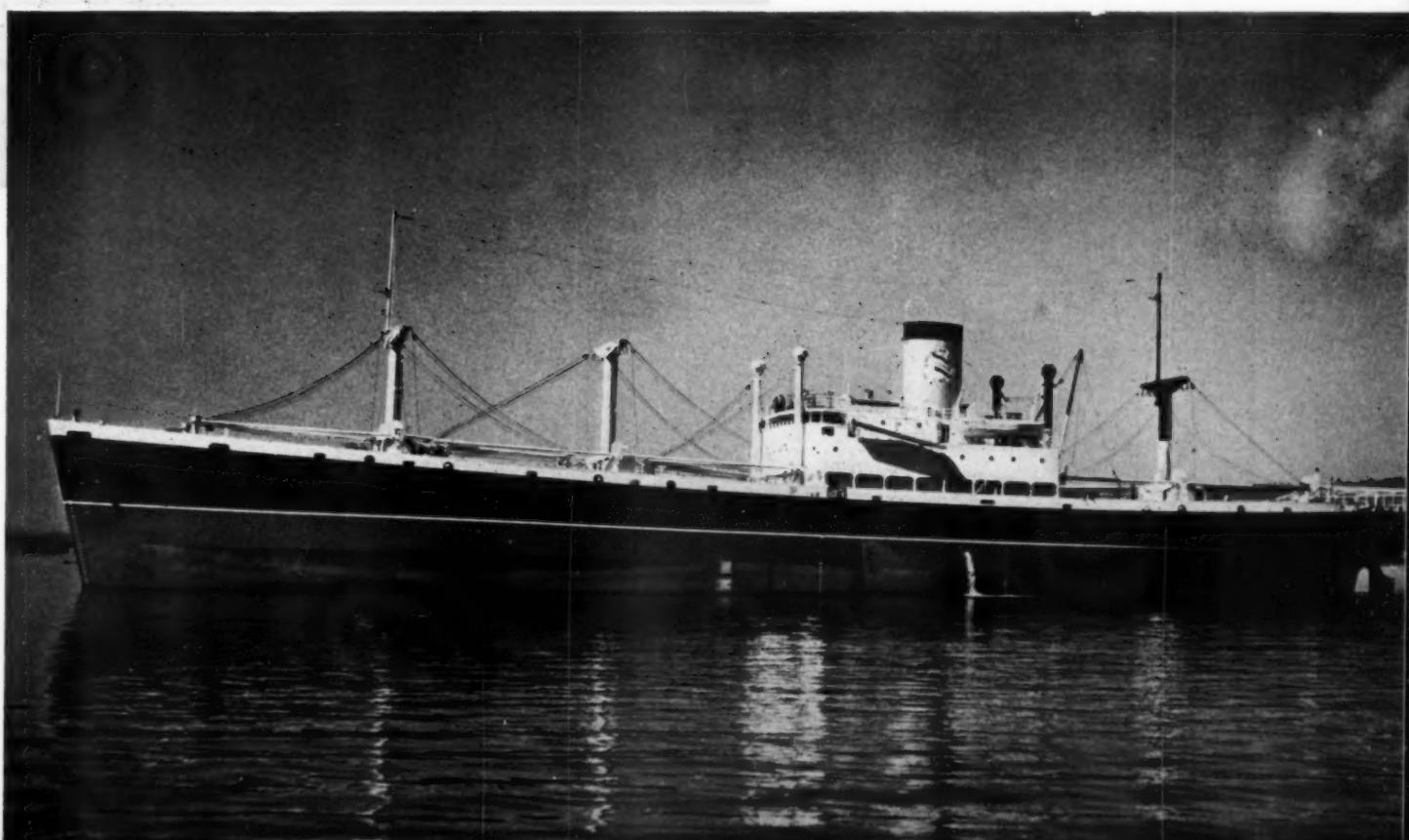
By CHAS. F. A. MANN

choicest Diesel-electric layout ever installed in a standard cargo ship model. The whole chain of supply, from welding rod to main engines, had to be set up and put in motion before *Cape Alava* was completed. The other four ships, *Cape Flattery*, *Cape Fairweather*, *Oregon*, and *Idaho*, followed in thirty-day intervals, despite rapid changeover of two of the hulls from intended Bauxite carriers to cargo ships, and a shift in ownership from Alcoa Steamship Co. to the Atlantic & Pacific Steamship Co., replete with new names—the *Oregon* was originally launched as the *Cape Cleare*, and the *Idaho* as the *Cape Douglas*.

The Capes *Alava*, *Flattery*, and *Fairweather* are now in service of the American Mail Line and reported as highly successful, swift cargo ships in practical operation, economical, and actually faster than designed speed.

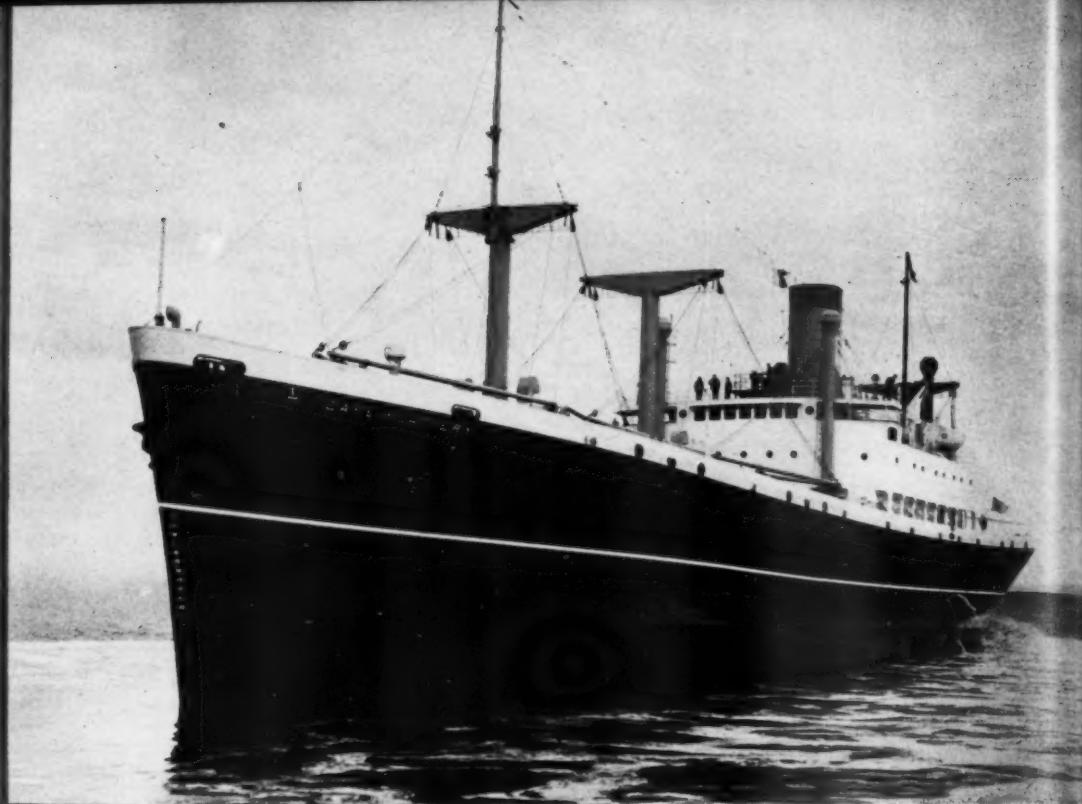
The ships are of the C-1-B Maritime Commission design, flush deck, full scantling, with raked stem and cruiser stern. When fully loaded, they ride low in the water, looking like slim yachts. The machinery and crew's space occupies the entire midships section, and low tubular steel cargo masts and four neat ventilator intakes add to the smooth lines and simplicity of exterior details. The interior layout and finish in crew's spaces is complete down to the last detail of refinement, and nobody sleeps or lives below the main deck level. The 99.99% fireproof construction, fully electrified galley, ventilating, air conditioning

The five Diesel ships are identical in all construction and equipment details. This is the "Cape Flattery", second on the schedule, ready for trials.



These sleek cargo ships—
more like luxury liners in
appearance—typify the re-
markable progress in de-
sign under the U. S. Mar-
itime Commission Long
Range program.

Captain Storey (and son)
of the American Mail Line
M. S. "Cape Flattery."



systems, modern hotel-type plumbing, and every known useful navigation and communication aid, all help make the ships distinctive, long-lived, low in maintenance costs and economical to operate, even in these days of fabulous high labor costs and complex Union rules.

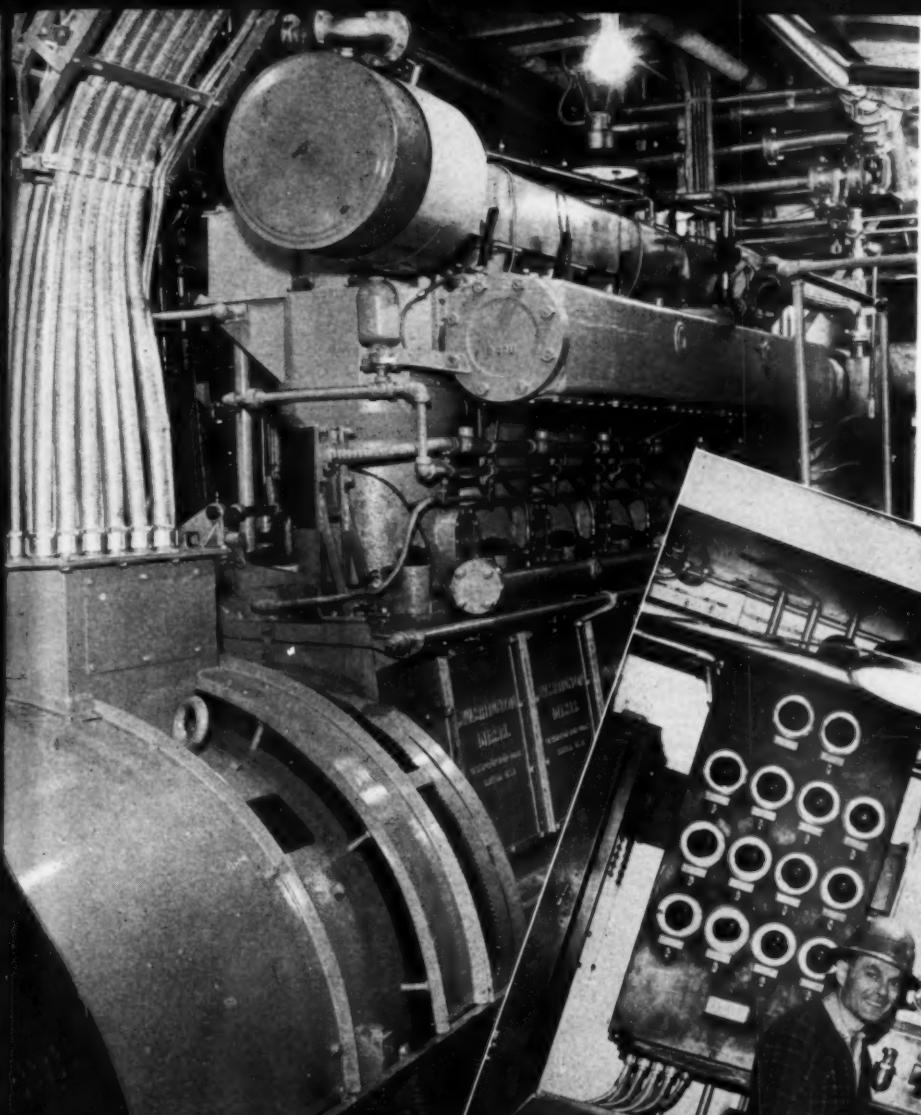
The five sister ships are 416 ft. x 60 ft. x 27 ft. 6 in. draft, loaded, in overall dimensions and have a speed of fourteen knots with 7878 tons of cargo.

The entire mechanical layout of the main Diesels, auxiliary Diesels, pumps, fuel oil handling, electric system, etc., is arranged in complete duplicate, for continuous operation and no delays either at sea or in dock. The main Diesels in each ship are identical, consisting of two very compact 6 cylinder, 2 cycle, trunk piston, 21½ in. x 27½ in. Hamilton Diesels, rated 2100 hp. at 233 rpm.

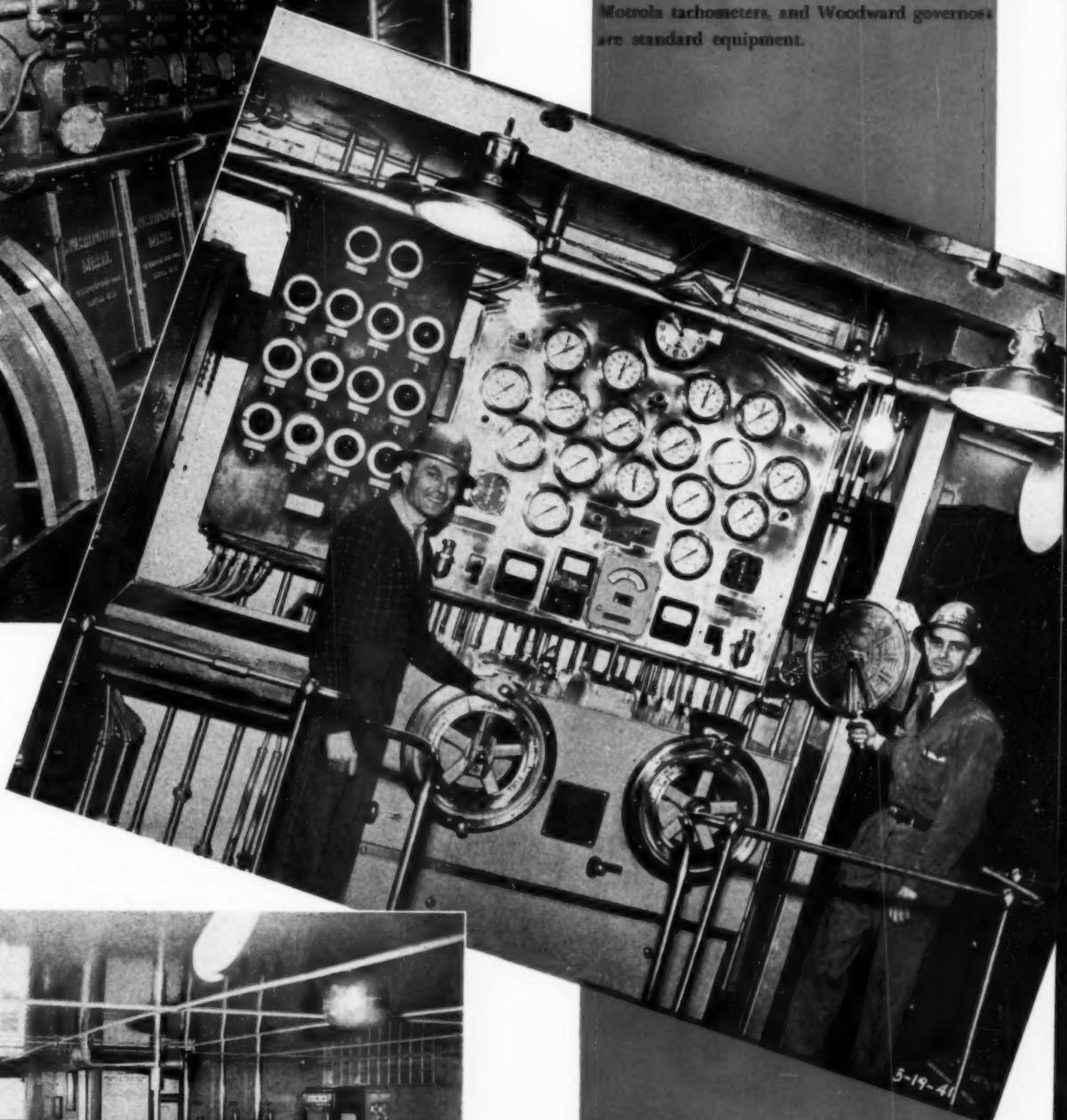
The propulsion layout is based on geared electric coupling to a single propeller shaft. Each Diesel drives through a Westinghouse electro-magnetic coupling, of the self-cooled, squirrel cage induction type, 95 inches in diameter, transmitting 2080 hp. at 233 rpm. Each coupling driven member drives against a Westinghouse single reduction, double helical gear, 103 inches in diameter, at 2.55 to 1 ratio. An independent lubrication oil system, complete with dual pumps, filters, and heat exchangers, takes care of the reduction gearing and the Kingsbury thrust bearing. The five-section Erie Forge propeller shafting drives a 17 ft. 6

One of the
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five ships

Chief En-
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lines an A
the main
Pilot house
Flattery."



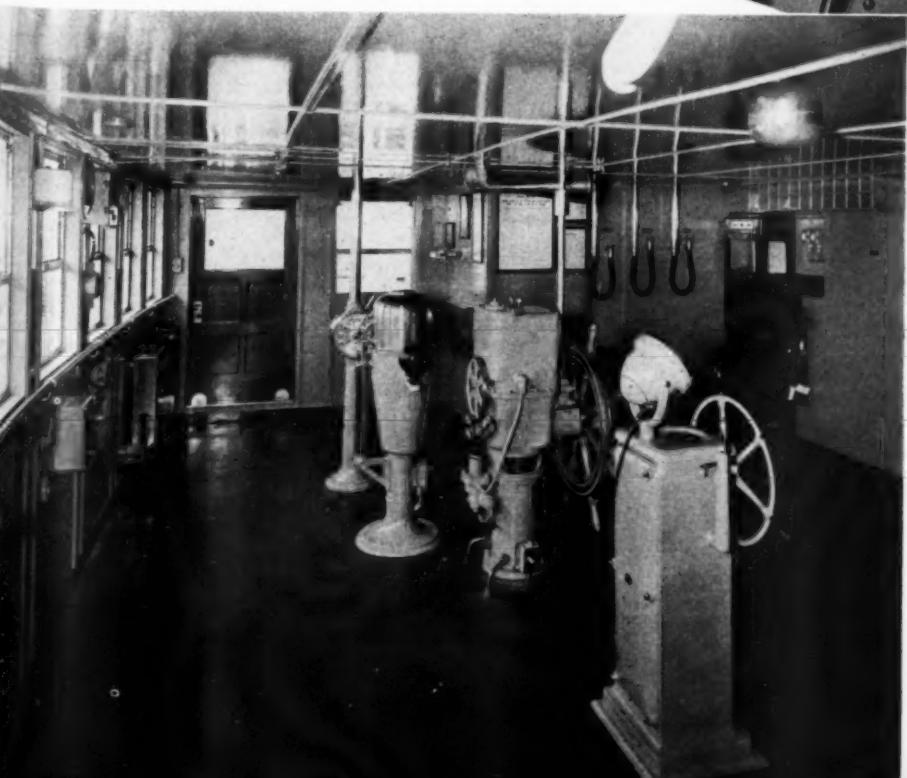
8. Doran Bronze propeller. Each ship is equipped with an elaborate heating and centrifuging system, with Ross heat exchangers and Sharples centrifuges, to permit use of black boiler oil instead of more expensive Diesel fuel oil, an innovation which cuts fuel bills one-third and has been successful. Roots-Connerville scavenging blowers are geared directly off each main Diesel. Mansell lubricators, Jones-Motrola tachometers, and Woodward governors are standard equipment.



One of the pair of Washington Diesel and G.E. auxiliary generating sets on each of the five ships.

Chief Engineer Don McKay, of the "Cape Flattery," grand nephew of Donald McKay, right. The gauge board carries an Almor pyrometer for the main engines.

Pilot house of the "Cape Flattery."

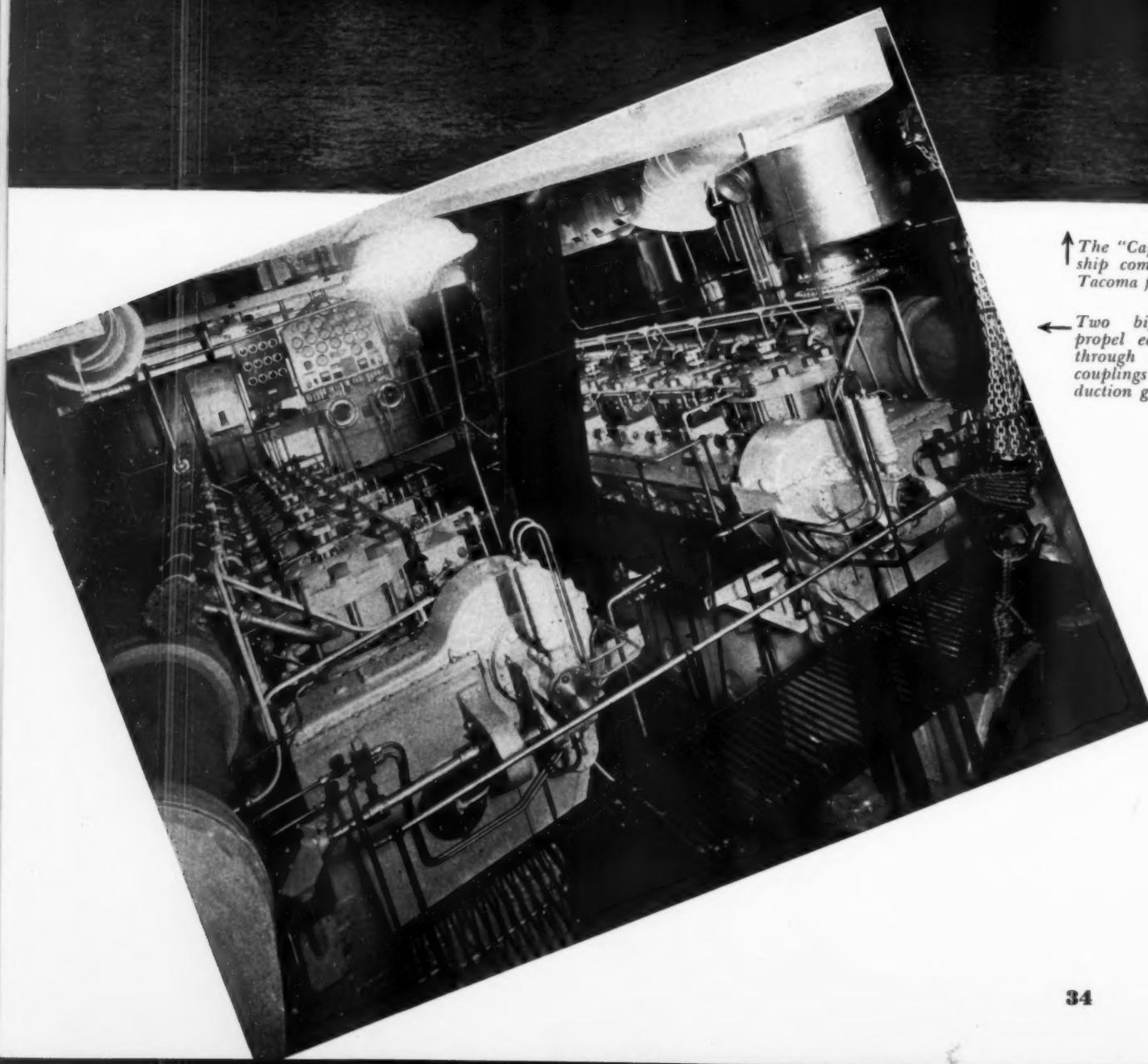


5-19-41
The entire auxiliary machinery layout, both on deck and in the engine room, is electrically driven, power being supplied by two identical Washington 4 cycle, 6 cylinder 12½ in. x 16 in. bunk piston Diesels, developing 525 hp. at 450 rpm., and driving 275 kw. 120-240 volt D.C. General Electric generators. About 90 amps. of auxiliary current are needed to energize the Westinghouse coupling.

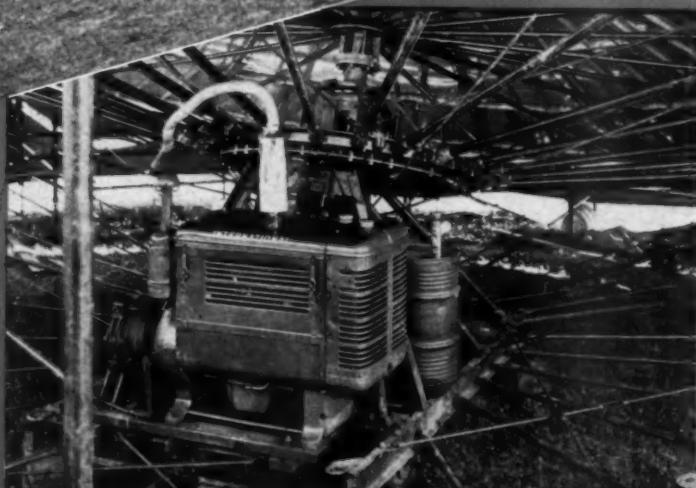
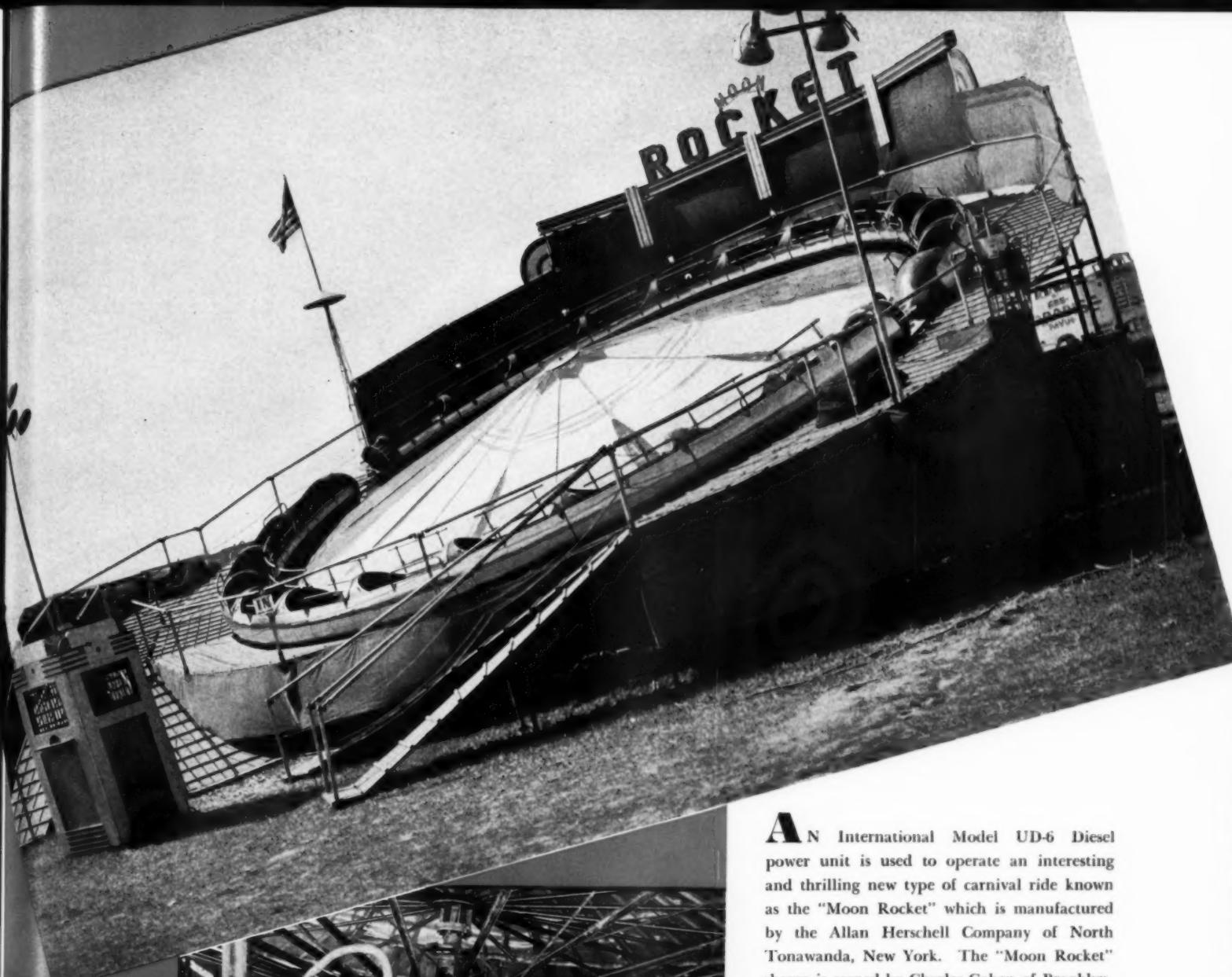


↑ The "Cape Alava" was the first ship completed on the Seattle-Tacoma five-ship schedule.

← Two big Hamilton Diesels propel each of the five ships through Westinghouse electric couplings and Westinghouse reduction gears.



This new
Carnival is
powered by
the Inter-
Diesel units

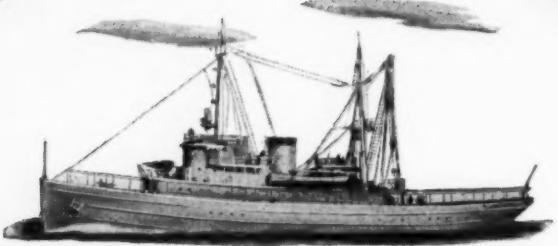


This new kind of carnival thriller is powered by the portable International Diesel unit, right.

"MOON ROCKET" DIESEL DRIVEN

AN International Model UD-6 Diesel power unit is used to operate an interesting and thrilling new type of carnival ride known as the "Moon Rocket" which is manufactured by the Allan Herschell Company of North Tonawanda, New York. The "Moon Rocket" shown is owned by Charles Cohen of Brooklyn, New York. It served as a part of the Catlin-Wilson Shows the past season and was photographed on a show lot at Niagara Falls, N. Y. The "Rocket" ride consists of an inclined circular track forty feet in diameter. Two trains, or "rockets" as they are called, each consisting of eleven cars, are operated on this inclined circular track at a maximum speed of eighteen revolutions per minute, or approximately twenty-six miles per hour. Passengers are seated in tandem fashion, capacity being four adults or six children to the car. By use of the Diesel engine, acceleration and deceleration have been considerably shortened. Inside the tracks there is a decorative sheet-aluminum dome which constantly revolves, even while idling, thus providing continual "bally." Power is transmitted by V-belt to a set of gears, as shown underneath the dome in two of the illustrations. The "Moon Rocket" ride takes a space of fifty feet front and fifty-four feet deep, including ticket office space. The rear elevation to the top of sign is about 27 ft. The entire equipment weighs eighteen tons.

Pulling for the Navy



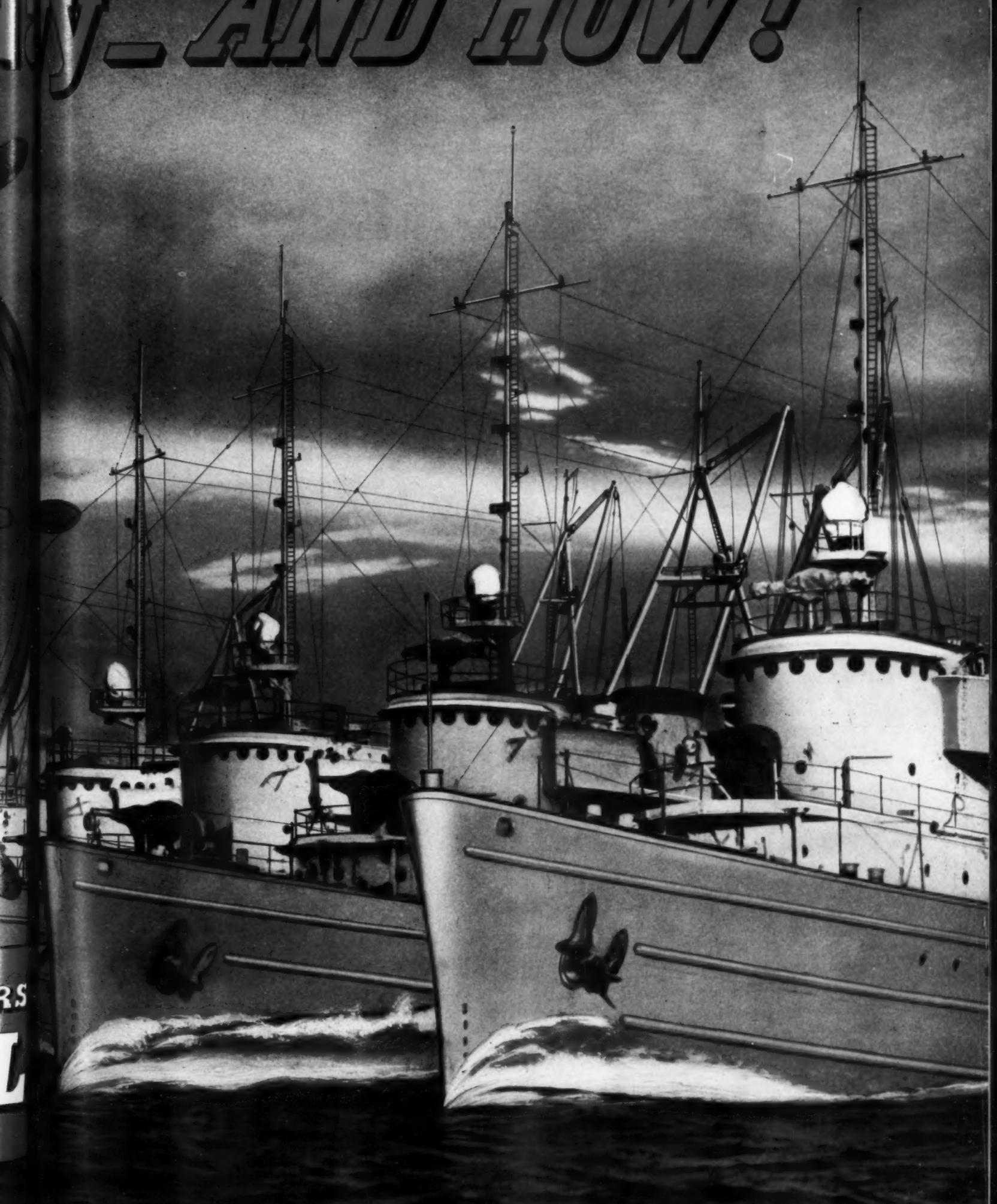
THESE U. S. Navy fleet tugs are the most powerful vessels of their kind in the world. They're powered with a GM Diesel-Electric Drive. That means they're tops in dependability and efficiency. And in the Navy's wide use of GM Diesels in this time of national emergency, builders and owners of commercial craft will find real evidence of what such power can also do for them. There will be 28 of these Diesel Electric tugs—all powered by General Motors.

CLEVELAND DIESEL ENGINE DIVISION

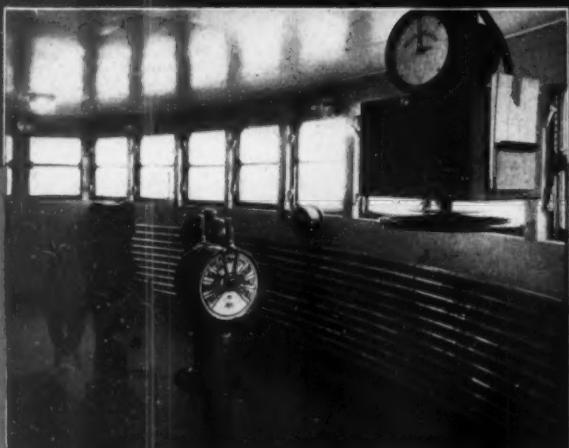
General Motors Corporation, Cleveland, Ohio

GENERAL MOTORS
DIESEL

U-AND HOW!



Boarding inspection walk high ery spaces. to see the fully organ stern lower business-like der, 2 cycl Diesels rated up to the two Elliott and Farrel is a type of acceptance smoothness couplings generator utilizing a signed that either eng



Pilot house view showing steering wheel, binnacle, engine room telegraph and propeller shaft tachometer.

Airplane view of the "Victoria" preparing to dock at Hoboken after her trial run down the Hudson River November 11.—N. Y. Daily News Photo.

"VICTORIA" FIRST OCEAN GOING VESSEL BUILT AT ALBANY

By WILBUR W. YOUNG

Albany, N. Y., November 10—Today a large group of the marine brotherhood, shippers, bankers, and public officials witnessed the culmination of a modern miracle. They came from up and down the Atlantic Coast, from the Middle West, and from South America—as guests of the builders, Cargill, Incorporated—to inspect the completed *Victoria*—a 12,500 ton all-Diesel, ocean-going cargo ship—the first of her kind to be built at the Port of Albany. But not the last, for at the luncheon which the builders graciously provided for their guests, following inspection of the *Victoria*, Austen S. Cargill, Vice President of Cargill, Incorporated, announced that another similar vessel would

start building immediately and that some materials for the second ship were already on hand. This decision was welcomed as a great contribution to the Port of Albany.

Revolutionary methods were employed to construct a ship of this size on a river channel less than 700 feet wide without the customary huge shipway. The *Victoria* is 445 ft. long, 60 ft. wide and has a loaded draft of 28½ ft. The hull was launched, constructed to half height, and completed alongside the dock formerly used by the Colonial Beacon Oil Company. The partly completed hull was skidded into the Hudson River April 10 this year and was chris-

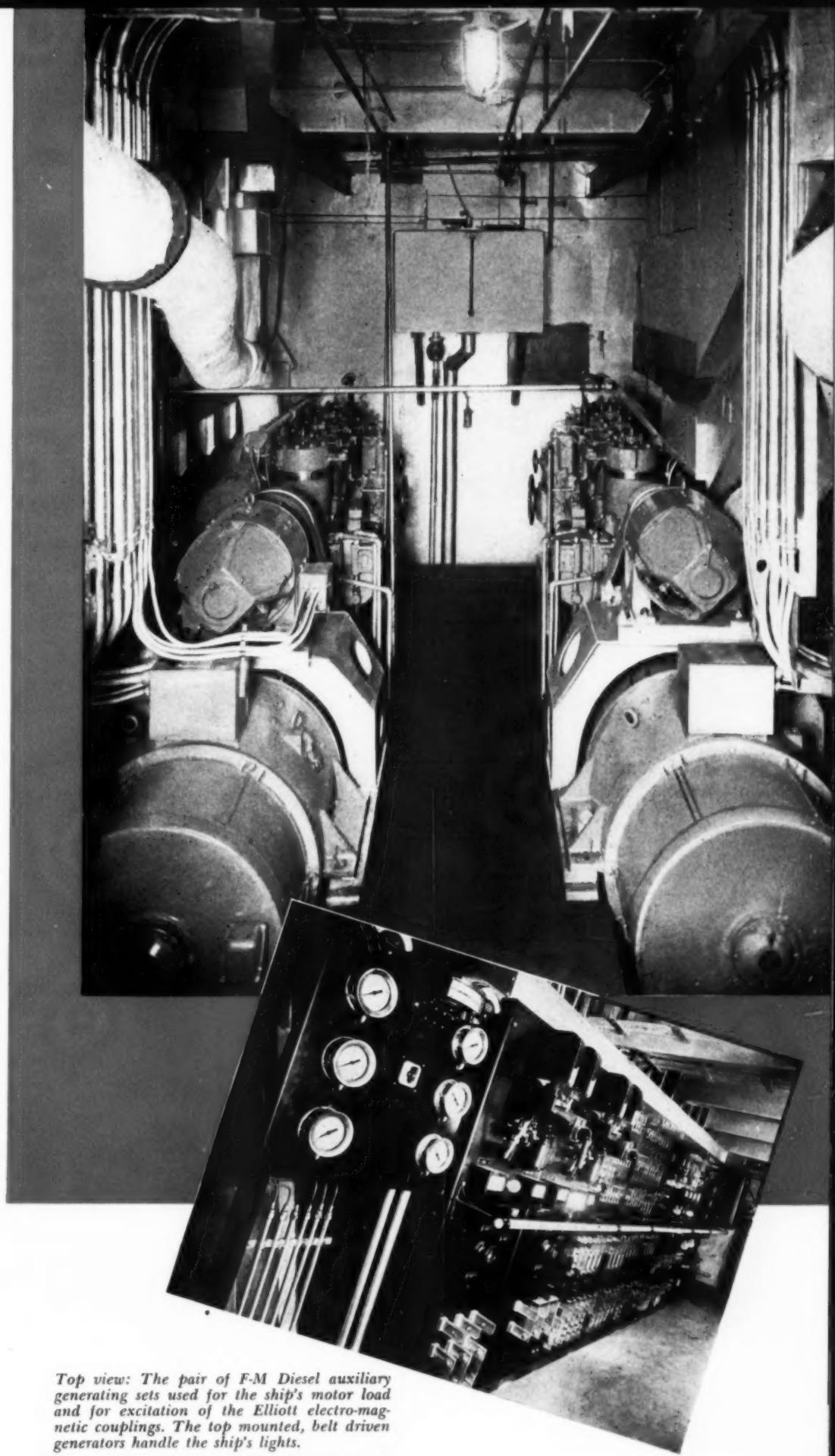
tened "Carlantic" by Mary Marshall, daughter of the Superintendent of Albany's huge grain elevator. This, by the way, is known as the world's largest grain elevator. Its capacity is 13,500,000 bushels and Cargill, Incorporated, leases the property. Cargill, Incorporated, undertook construction of the "Carlantic" to serve as a grain carrier in its world-wide operations but Mr. Cargill explained that the vessel was sold because of war conditions. So, renamed *Victoria* for her new owners, Compagnia Argentine de Navegacion Mihanovich Ltda. of Buenos Aires, this history-making vessel will enter South American service as a tanker, following her sea trials.

Boarding the *Victoria* midships, the large inspection party made its way aft over the catwalk high above the main deck to the machinery spaces. Strange—or isn't it—how folks like to see the machinery that makes our wonderfully organized modern ships go. In the very stern lower engine room were seen the pair of business-like looking Fairbanks-Morse 6 cylinder, 2 cycle, direct reversible, main propulsion Diesels rated 1050 hp. each at 300 rpm. hooked up to the single 12" propeller shaft through two Elliott electro-magnetic air gap couplings and Farrel-Birmingham reduction gears. This is a type of marine drive that is gaining wide acceptance in this country because of its smoothness and flexibility. Mounted above the couplings and gear is the F-M 350 kw. main generator with a unique drive arrangement utilizing a Diamond Chain connection so designed that the generator may be driven from either engine by shifting the chain.

A swing around the lower engine room revealed the well-arranged and essential engine accessories including Briggs Clarifiers for both fuel and lube oils, and Sharples centrifuge for fuel oil, Nugent duplex pressure strainers attached to each of the main engines for final fuel filtration before injection, four large Schutte & Koerting heat exchangers installed for engine cooling, and two Ross heat exchangers for cooling the lube oil and the two G.E. motor driven F-M turbine type cargo pumps. It was noted the various water, oil and ship's service pumps are F-M motor driven.

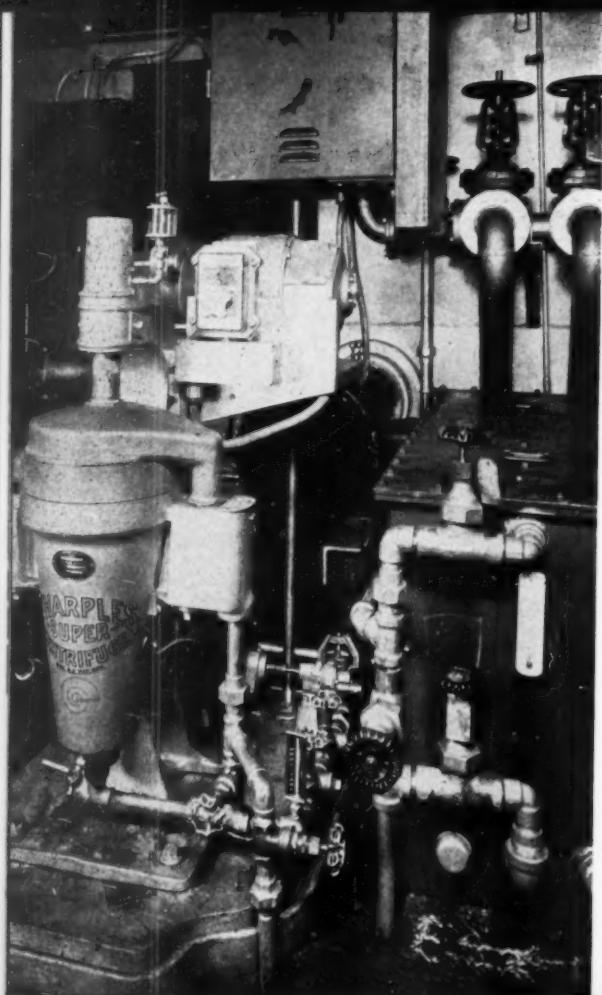
Then, aft of the main engines on a raised deck flush with the upper engine room were seen the two auxiliary units consisting of a pair of Fairbanks-Morse 4 cylinder, 160 hp., 400 rpm. Diesels, direct connected to F-M 100 kw. generators which supply current for the ship's motors and for excitation of the electric couplings. Two Electro Dynamic lighting generators are superimposed on the auxiliary units with V-belt connections. It was noted that structural members carry these auxiliary units.

Going forward on the starboard side of the upper engine room, there were seen two Gardner-Denver air compressors with direct connected F-M driving motors and the air storage bottles for engine starting and maneuvering. Forward, center, is the engineer's station with remote engine controls, signal and gauge boards, carrying U. S. air and oil gauges, Weston main engine tachometers, Electric Tachometer for indicating propeller shaft speed, and Brown pyrometer. On the port side is the main switchboard, built by Pelham Elec-



Top view: The pair of F-M Diesel auxiliary generating sets used for the ship's motor load and for excitation of the Elliott electro-magnetic couplings. The top mounted, belt driven generators handle the ship's lights.

Above: The main switchboard with the auxiliary Diesel gauge board, mounting pyrometer and Weston tachometers, left foreground.



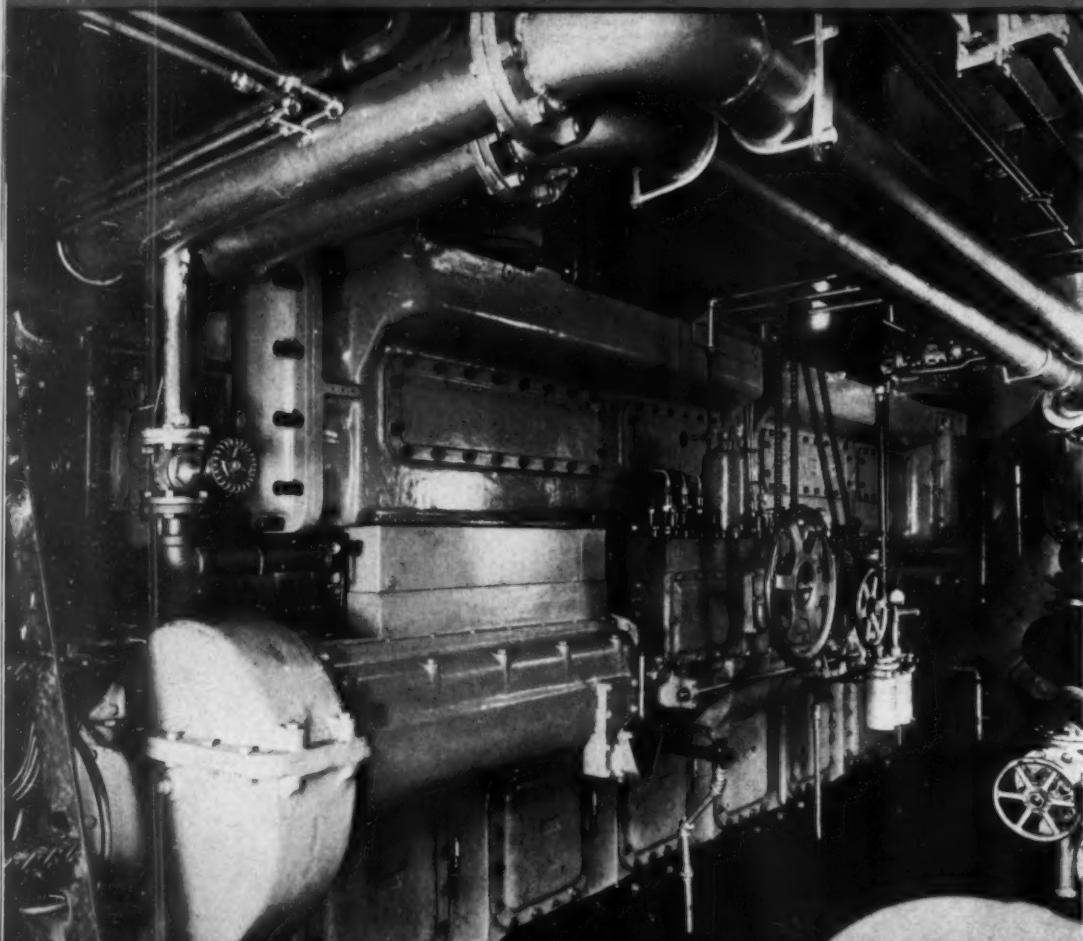
Sharples centrifuge, left, and Briggs clarifier, right, on the fuel oil system.

tric Mfg. Co. Nested high above the engine room in the unusually elongated oval funnel is the battery of Burgess intake and exhaust Snubbers for all four Diesels.

Here in the machinery spaces, the keynote of the entire vessel is struck: Modern machinery and accessories of accepted design and construction; arrangement to provide the maximum of efficiency; accessibility and working space; a highly organized power plant, the equivalent of which on shore would occupy many times the room allotted in marine practice, a compelling reason for the fast growing popularity and acceptance of marine Diesels.

Above the engine rooms, on two decks, are crews' quarters, galley and mess rooms—all complete with every modern hotel convenience. It seems that every new ship built in these days outdoes its predecessors in treatment of quarters, in accomplishing closer semblance to homelike comfort. This is most noticeable in the new cargo vessels and work boats and here in the *Victoria* is seen the furthering of this praiseworthy improvement. Light, airy, comfortably furnished rooms—many of them for single occupancy by P.O.'s and a few with ample space for not more than two "able-bodied men." The furniture is all steel—in fact steel is used throughout in construction and outfitting the vessel to such an extent that, it was said, the only wood in the *Victoria* is in the steering wheel.

Control side of one of the Fairbanks-Morse main Diesels. Note Nugent duplex fuel oil filter.



The all-electric galley, also located in the aft deckhouse, is a marvel of modern sanitation and efficiency—monel metal work tables, sink and trim; electric grinders, mixers, toasters, egg boilers, refrigerators, and coffee maker.

The midships superstructure houses the control bridge, pilot house, radio room and officers' quarters, and is reached from aft and forward by raised catwalks, as well as by the main deck. Crew's and officers' quarters include accommodations for a total of forty which is a normal complement under our flag, but which, it is understood will be greatly reduced under the Argentine flag. While the *Victoria* is nominally the property of the Argentine Navigation Company, Mihanovich Ltda., she will fly the "Stars and Stripes" until sea trials are completed. Her huge holds have a capacity of 500,000 bushels of grain or its equivalent of liquid cargo. The ship will make her maiden voyage to Venezuela for oil and from thence to Argentina for flaxseed to be delivered to Albany.

On sea trials, which were held off Ambrose Channel Lightship November 13 to 17, the ship surpassed the highest expectations of builders, owners and naval architects, with special praise being lavished on the propulsion machinery.

The trials were among the most rigorous ever afforded a seagoing vessel, including such drastic tests as four hours under full load on the port and starboard engines separately and two hours and ten minutes under full speed astern. The vessel exceeded the speed guaranteed to the buyer by a full one-third and fuel consumption was well within the limits guaranteed by the manufacturers. All observers were immensely struck with the remarkable maneuvering qualities afforded by the twin Diesels, electro-magnetic clutches, and Farrel-Birmingham gears. The tests, from full speed ahead to full speed astern, were run several times with not the slightest sign of strain. The pilots and ship's officers were greatly impressed by the easy steering qualities afforded by the oversized rudder.

Great interest was evinced by the propulsion speeds which could be attained with only one engine in operation. With both engines operating, the normal propeller speed was 86 rpm. With one engine, 72 rpm. was developed, affording a sea speed of almost 85% of that under both engines. The remarkably fine results obtainable under one engine should mean, in actual practice, that nearly all repairs could

be affected in a short time lost in

A truly remarkable vessel, 150 miles from the nearest port, in partially completed condition, her original "the" largest vessel in the world a

interest of Cargill said

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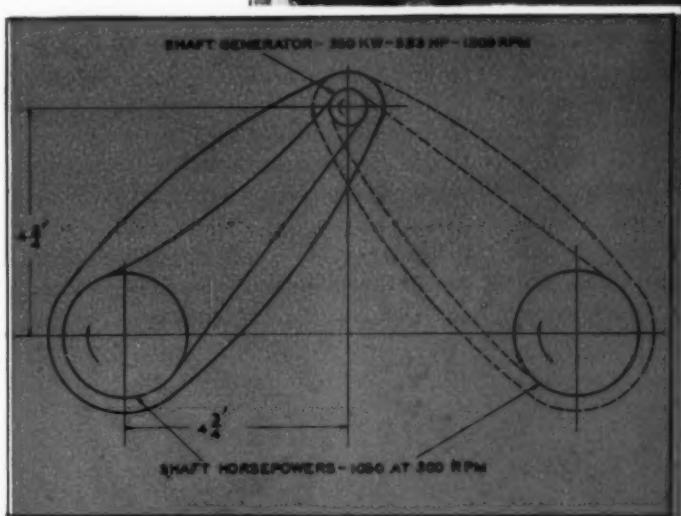
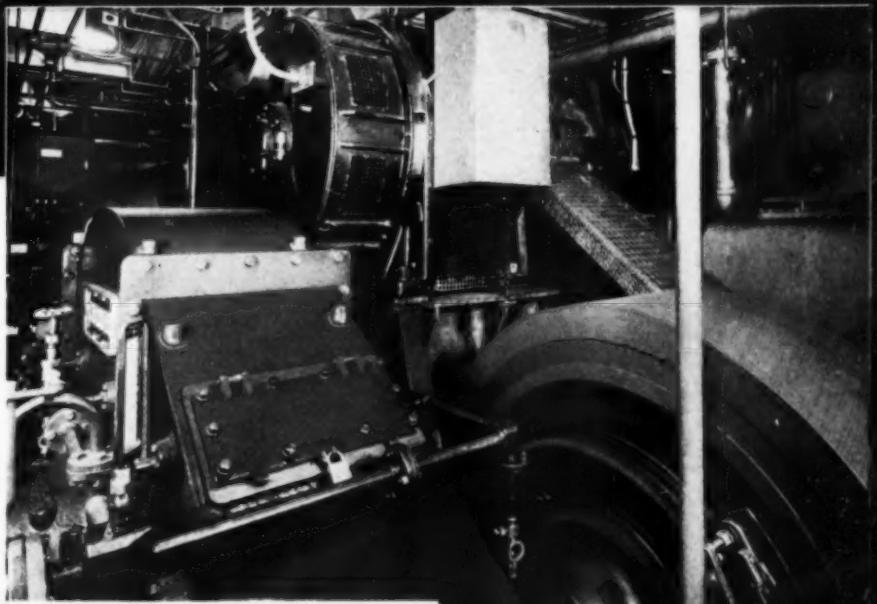
be affected at sea, resulting in a minimum of time lost in port for engine overhaul.

A truly remarkable ship—seagoing—but built 150 miles from the ocean; launched sidewise in partially completed condition; designed for her original owners—one of the largest, if not "the" largest grain transportation concern in the world and relinquished on completion to the great Republic of Argentina—yes, in the interest of South American good will. Mr. Cargill said ". . . and we may sell the next one—but we will keep on building them until we get one for our own use . . ." It looks as though the Diesel ship *Victoria* is the forerunner of a long line of her type—a type which sets a new pace in design and construction.

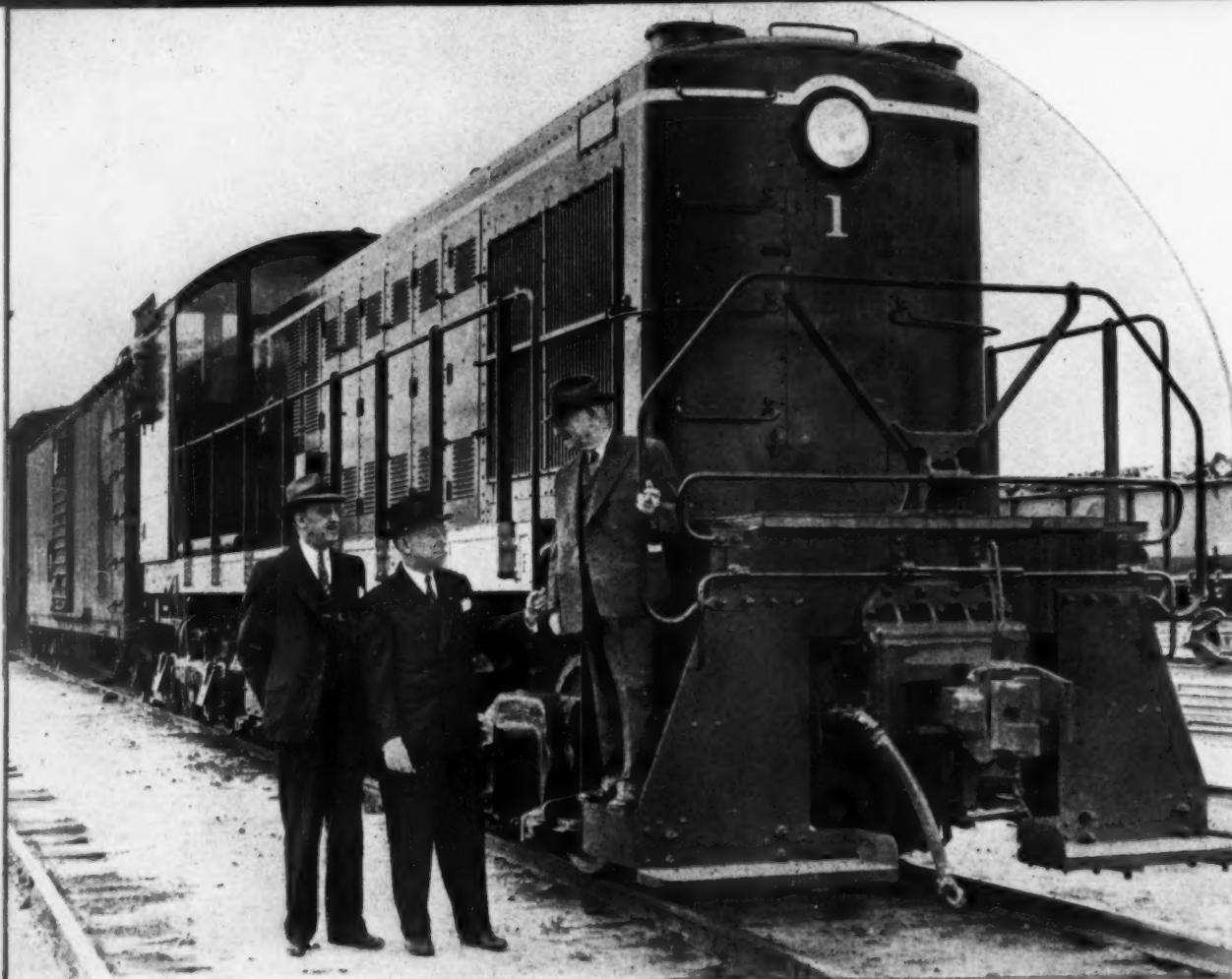
The inspection party here today was told that much credit is due the designer, Lorenz Hansen of George E. Sharp & Company, New York City, and construction superintendent, Chris Jensen of Minneapolis.

↑ Looking over the forward main deck and forepeak down the Hudson river valley.

→ The business end of one main Diesel with Elliott electro-magnetic air gap coupling, lower right, Farrel gear, left, and F-M shaft generator with Diamond Chain drive, above.



Diagrammatic sketch showing Diamond chain drive from main engines to the shaft generator. This arrangement permits driving the generator from either main engine.



J. A. McNaughton, V. P. and Gen. Mgr., right, and F. L. S. Harman, left, originators of the Los Angeles Junction Ry. Mr. Harman is Secretary of the Los Angeles Chamber of Commerce and Mr. J. A. Hartley, center, is President of the same body.

DIESEL SWITCHERS FOR LOS ANGELES

By JIM MEDFORD

LIKE Kipling's "Judy O'Grady" and the "Colonel's Lady," the new Diesel locomotives of the Los Angeles Junction Ry., and the Santa Fe's "Super Chief," are sisters under the skin. Designed and built by the American Locomotive and General Electric Companies, their difference, like the aforesaid damsels, is their appearance and status. Both serving Southern California's largest city, they have basically identical power units: 1,000 hp. Alco Diesels direct connected to G. E. generators, but there the similarity ends.

Recently placed in service to serve the 1,000 acre Central Manufacturing District with its 46 miles of standard track connecting 150 industries with the four national trunk lines, the two Diesel-electric switchers are Type-P, single

end, single unit control, each powered with 6 cylinder, 12½" by 13", 4 cycle Diesels rated 1,000 at 740 rpm., Buchi turb^o supercharged, direct connected to 300/600 volt generators supplying power to the four traction motors mounted one to each pair of wheels. Total tractive effort is 69,500 pounds at 30% at three to four miles per hour. The 65 amp. auxiliary generator and exciter are belt driven from the main generator shaft. The supercharger turbine is driven by the engine exhaust gases, and turns the centrifugal blower that forces extra air into the intake manifold. The engines are electric starting from 32 cell, 64 volt batteries.

Other interesting electrical equipment includes current limit relays set to operate at 900 amps.; grounding relay adjusted to pick up at 10 amps.;

reverse current control relay adjusted to pick up at 72 volts and to drop out at 56 volts with no current in coils.

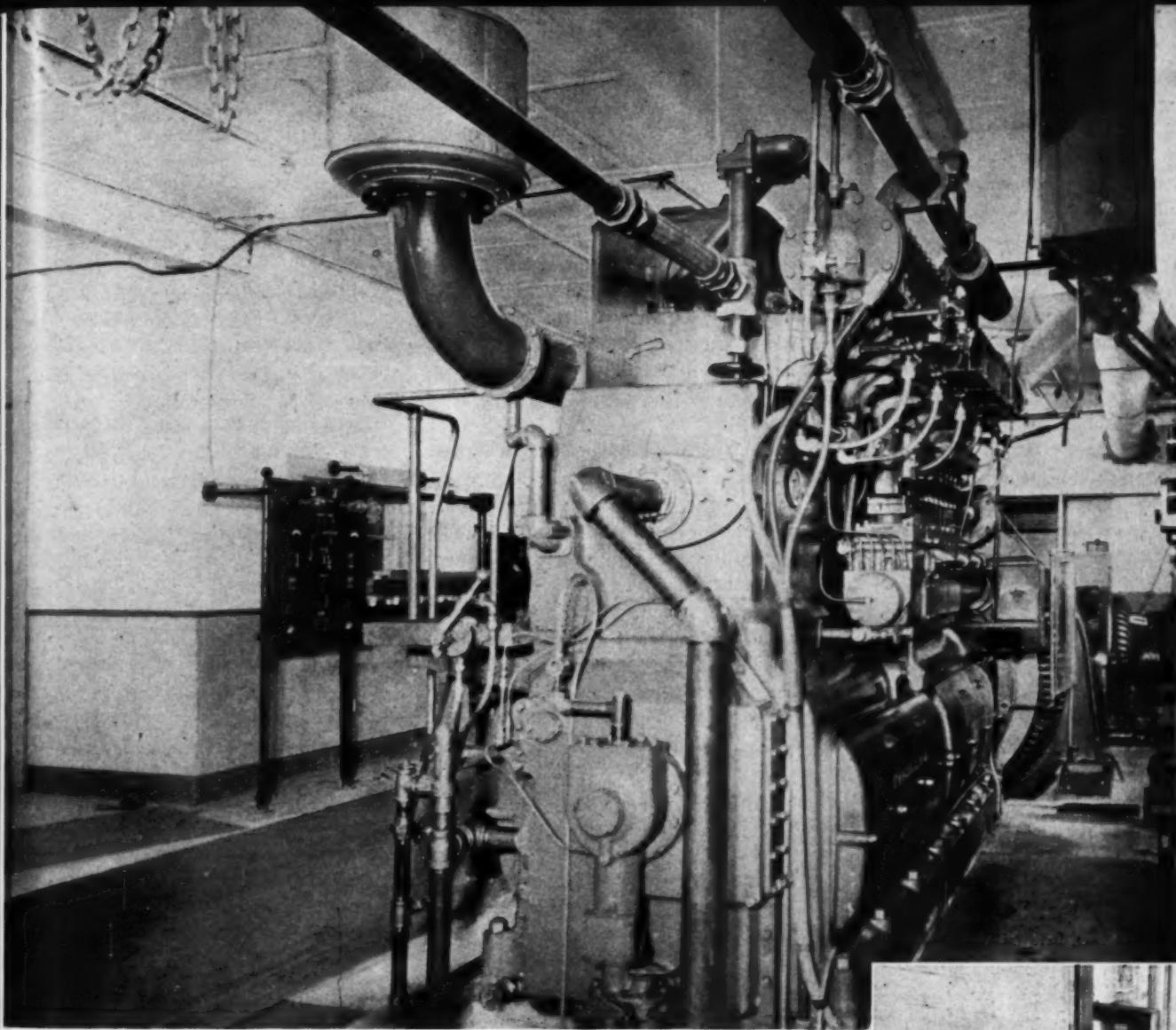
According to Superintendent L. E. Hall, it is expected that the two 46-ft. locomotives weighing 237,000 pounds each, ready for service, will give approximately the same efficiency and economy of three steam engines formerly in this service, now retained as standby power.

Additional equipment and operating items of interest include: Air-Maze intake air filters; Cuno Auto-Klean lube oil filters; American Bosch fuel injection pumps; Woodward hydraulic governor. Fuel oil capacity is 600 gals. sufficient for 36 operating hours. Lube oil is changed after 3,000 hrs.

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SKANEATELES, NEW YORK

By WILLIAM H. GOTTLIEB

OFFICIALS of Skaneateles, N. Y., have found that the most satisfactory way to learn the truth about Diesel economy is to own and operate a Diesel engine. This village of 2000 population has owned its own electric distribution system since 1900, when a 60-kw. municipal steam power plant was put into service.

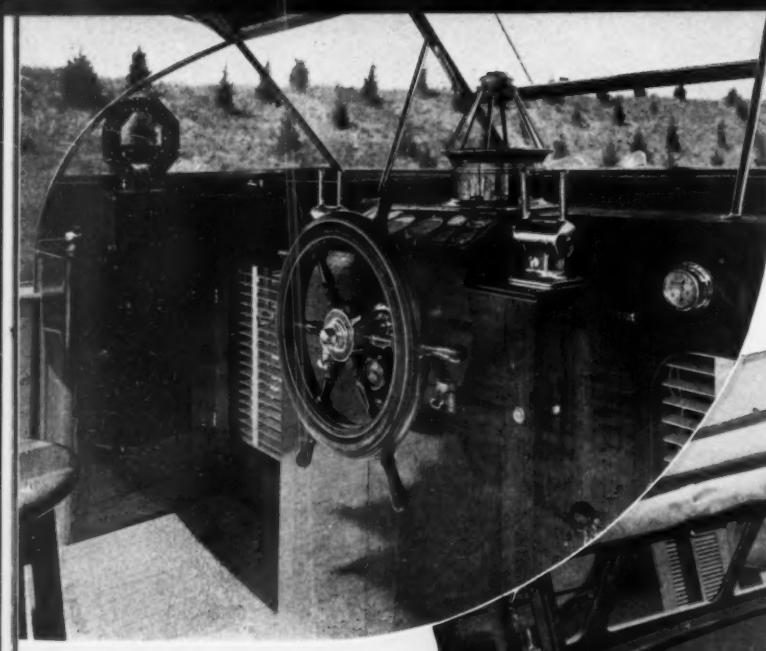
The steam plant was outgrown and discarded after relatively few years and the village began to purchase its full requirements from the Niagara Hudson Utility Company. In recent years, there was considerable debate among officers and taxpayers as to the advisability of installing Diesels to supply the village's needs. As a result, Skaneateles installed in January, 1941, a 540 hp. Alco Diesel.

After ten months of experience, the village can record three major accomplishments: first, it has saved a considerable sum of money under the rates for purchased power; second, it has the protection of a standby unit permitting continuation of essential services in the event of utility failure; third, it has laid the cornerstone for a future all-Diesel plant.

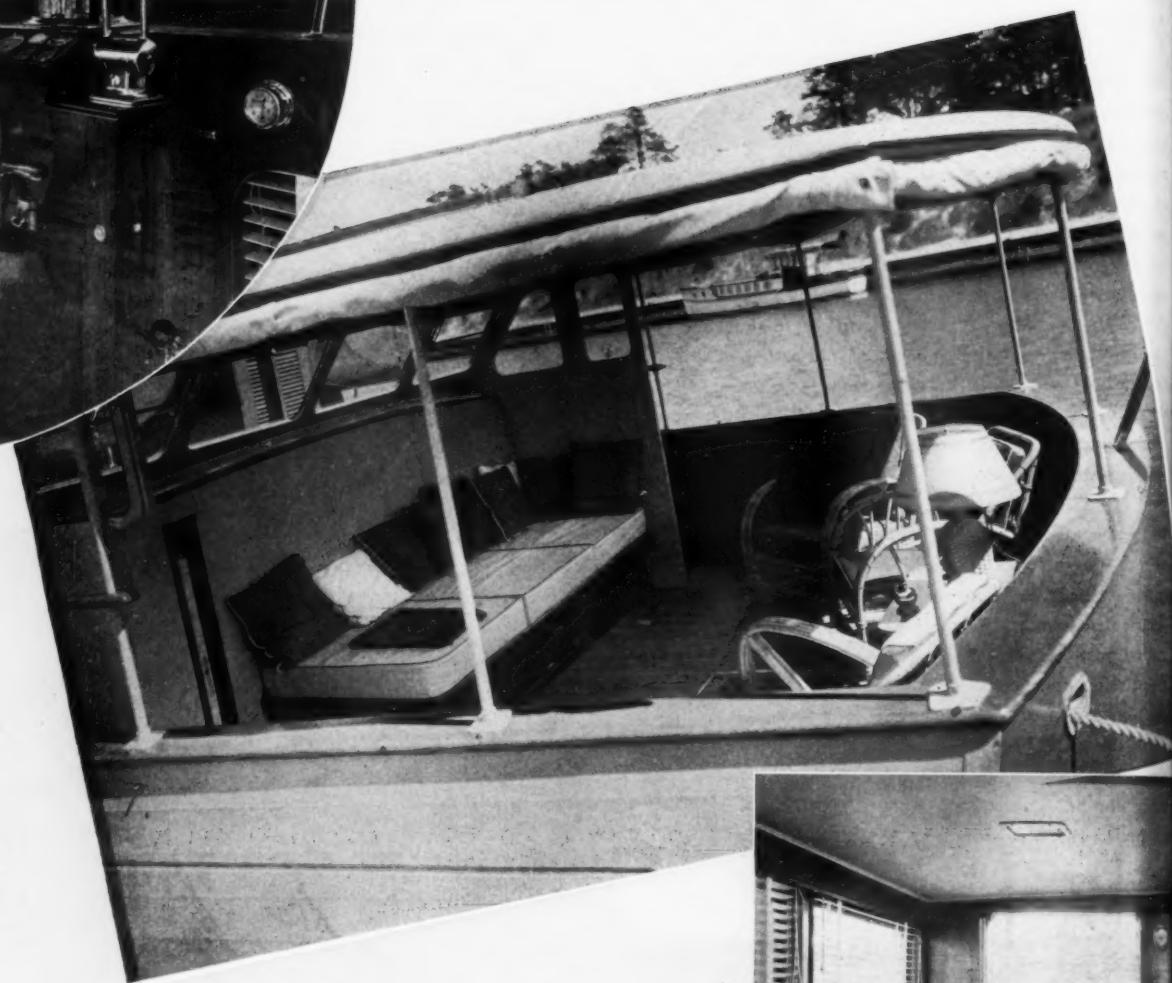
The engine that is teaching Skaneateles Diesel economy is a 6 cylinder unit of $12\frac{1}{2}$ in. bore and 13 in. stroke, developing 540 hp. at 600 rpm. This Alco Diesel is of the four cycle, mechanical-injection type widely used for both stationary and locomotive service. It is a highly compact and self-contained unit driving directly a 2300 volt, 3-phase, 60-cycle, Electric Ma-



Top view: The first of two similar units to be installed in the Skaneateles power plant, a McIntosh & Seymour Diesel and E. M. generator. Seen in this view are the Burgess intake filter Snubber, and American Bosch fuel injection pumps. Above: The Honan-Crane continuous lube oil refiner.



Pilot house view showing Bendix remote engine controls and direction finder.



The roomy and comfortably appointed cockpit.

“CHANTICLEER”

By DWIGHT ROBISON

IUTSTANDING among this season's private yachts is the Diesel-propelled *Chanticleer* from the boards of Frederick C. Geiger of Yacht Sales & Service, Inc., Philadelphia, and built by Mathis Yacht Building Company of Camden, N. J., for Samuel S. Sanford of New York. She is 65' long, overall, 62' on the water, 16' wide and 4' draft. Heavily constructed of oak frames and keel with $1\frac{1}{8}$ " Philippine mahogany planking, her deck from stem to stern and flooring in the cockpit and owners quarters are of teak. Owner's quarters, aft below deck, consist of a large stateroom and bath. Forward are dinette, galley, stateroom and crew

accommodations for two. Deck arrangements include a large stern cockpit with standing awning, trunk cabin with stowage of two 10' dinghies, bridge deck with windshield and portable awning aft of deck house and the deck house with a large living room which is accessible to dinette and forward quarters. The engine room, located midship under the deckhouse, is fitted with a pair of Gray Marine Diesels, of four cylinders each, $4\frac{1}{4}$ " bore, 5" stroke, rated 110 hp. at 2000 rpm. driving the 28" x 24" propellers through a 2:1 reduction gear. These Diesels give the *Chanticleer* a cruising speed of 12 mph. and a top speed of



14 mph. A 3 kw. generator is mounted between the main engines and is arranged for belt drive from either engine. Other engine room equipment consists of a Fairbanks-Morse pressure water system, electric bilge and sump pumps. Navigation equipment is unusually complete with photo-electric steerer, direction finder, speedometer and log, also telephone.



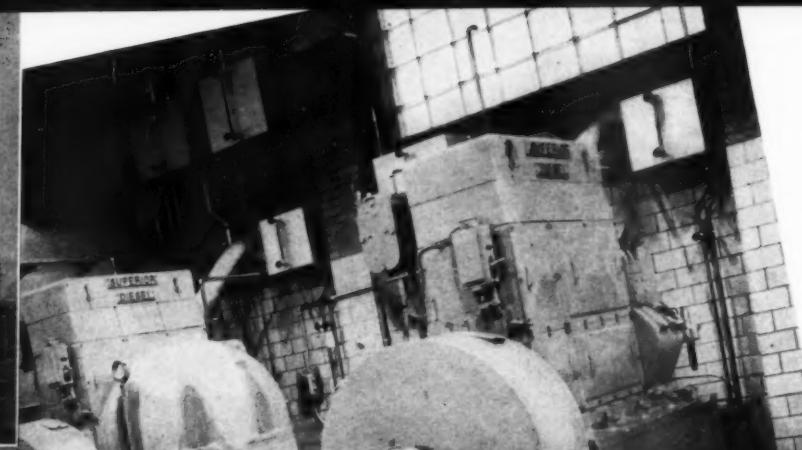
View looking forward in the spacious deck house living room.

← *Looking aft in the living room.*

The "Chanticleer" cuts the water at 14 mph. with her Gray Marine twin Diesels.

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Upper left: The York Street pumping station, Springfield, Mass. Note Maxim Silencers. Above: There are three Diesel pumping units, two of which are shown here, all mounted on Hussman Spring bases.

**DIESEL PUMPING
STATION,
SPRINGFIELD,
MASS.**

By DOUGLAS SHEARING

FOR a year, three Diesels have been operating in the heart of the city of Springfield, Massachusetts, multimillion dollar sewage system, providing the pumping power vital to this service. The experience of this year has justified the city engineers' choice of Diesels for this heavy duty, continuous service. Economy of operation has been enhanced by completely dependable, trouble-free performance. When the city constructed the York Street station a year ago, it implemented a four million dollar flood control and sewage disposal program. This included four new pumping stations, additions to two old plants, interceptor sewers, and a sewage treatment plant. To pump flood water from the low level streets back over the retaining walls into the Connecticut River, the city installed large centrifugal pumps driven by high-speed gasoline engines. But, for continuous sewage work, the engineers picked three 106 hp. Superior Diesels, driving vertical, centrifugal sewage pumps through flexible couplings and right-angle gears.

The three cylinder, 9 in. x 12 in. Diesels are of the four-cycle, mechanical-injection type and deliver their rated horsepower at 500 rpm. Two of the sewage pumps are rated at 10,500 gpm. vs. a 20 ft. head, while the third delivers 8,000 gpm. against a 34 ft. head. This gives a

total capacity of 41,760,000 gallons per day. In practice, the three engines are never run at the same time and it was not intended that normal demands should rob the city of standby protection. For the most part, one engine handles the load and it is the practice in this plant to run each engine alternately for a month at a time. When rain raises the sewage level, a second engine is started to handle the increased load. If the rain is too heavy, the sewage is discharged directly into the river since the disposal plant, on an island near the opposite bank of the river, can not handle the heavy volume of water and sewage content falls below 20 per cent.

An idea of the economy of operation can be gleaned from the fact that the Diesels pumped more than 150,000 gallons of sewage through the pipeline to the disposal plant for every gallon of fuel consumed. The engines handled 30,000,000 gallons of sewage for each gallon of lubricating oil consumed. As for dependable performance, it is a fact that there were no breakdowns and no repairs whatsoever in this first year of operation.

In designing this plant, the engineers gave serious consideration to the problem of engine vibration. It was obviously of prime impor-

tance to guard the pumps and other sewage handling equipment against undue stress and wear. The main sewage pumps, driven through gears, required special attention. A simple and effective answer to the major vibration problem was the installation of Hussman spring mountings for all three Diesels. Each engine rests on a concrete slab which is supported above the concrete foundation by ten spring mountings designed by Carl Hussman, Engineers, to suit the specific requirements of this installation. These units are of welded steel construction, impervious to action of oil, water or sewage, and with sufficient reserve strength to insure permanent service. The success of the isolation is evident to any visitor, for there is no sign of vibration even within a foot or two of an operating engine. This factor undoubtedly contributes much to the faultless operation of the plant. To complete the isolation, the engines are connected to the right-angle gears through flexible couplings. The gears themselves stand in squares cut in the concrete and are separated completely from the engine foundations.

The York Street station is a thoroughly modern plant and, as befits its importance, is well equipped with protective auxiliaries. The handling of everything that enters the engines—fuel, lubricating oil, cooling water and intake air—is designed carefully to protect the prime movers. For example, engine air is drawn through individual oil bath filters located outside the plant. All air entering the engine room is filtered by the ventilation system.

The cooling water system is of the closed type with an evaporative cooler as the key unit. Water flows to the engine jackets from a 300 gallon tank high on the engine room wall, then to the evaporative cooler, also inside the room, and finally back to the tank. Soft water from the city supply is piped to the tank for makeup. Water from this tank also is used to lubricate the sewage pumps' sealing rings. A centrifugal circulating pump is V-belted to each engine.

All parts of the engines are supplied with lubricating oil by a pressure circulating system. Oil is drawn from the sump by an engine-driven pump and sent through filter and cooler to a supply tank. From this source, oil reaches the suction of the engine's pressure pump which supplies the bearings, camshaft, governor, and other parts. Every 100 hours of operation, oil is drained from the supply tank to a dirty oil tank in the basement where it is centrifuged before again returning to service. A railway line passes between the plant and

the river and fuel can be unloaded by gravity directly from tank cars into the 15,000 gallon underground tank. A motor-driven pump sends the fuel through a filter and meter to the 40-gallon elevated day tank for each engine. From the day tank, fuel passes through another filter to the suction of the engine pressure pump, a cam-operated, untimed, plunger-type unit. Fuel is kept at a relatively constant high pressure in a header with lines to each cylinder spray valve. The valves are opened by cams for injection of the fuel into the cylinders. Pressure in the system, which directly controls the quantity of fuel injected, can be regulated by adjusting the tension of a single spring which in turn controls the suction valves of the pressure pump. An automatic control of fuel injection is exercised by the engine governor which regulates the time the spray valves are held open. Drains are provided at every point in the engine system where fuel may overflow. This oil drains to a small tank, passes through a filter and then is pumped back to the day tank.

An interesting feature of Diesel-driven sewage pumps is their effect as a governor on the engines. If an engine increases its speed, the pump it drives handles more sewage and this greater load tends to slow down the engine. Similarly, any decrease in engine speed reduces the volume of sewage pumped with a resultant increase in engine speed.

The Superior Diesels used in this plant are of the convertible type and either oil or sewage digester gas of 600 Btu. can be used as fuel. The possibility of using a waste product to operate the engines opens new vistas of economy for the plant. When the units were installed, conversion parts were provided but have not as yet been put into use. When assured a steady supply of gas from the disposal plant across the river, one or more of the engines may be converted to gas operation. It is possible that one engine will be continued on oil to provide a standby in the event of some failure of the gas supply. The economy of oil operation has been such that Springfield engineers are in no hurry to convert their engines.

An alarm system warns the operator if the engine overheats, and if the condition is not corrected promptly, an automatic device stops the engine. A gauge board on the control end of each Diesel holds pressure gauges, a tachometer, and a multi-point exhaust pyrometer, enabling the operator to learn the condition of his engine at a glance. Hourly readings are taken and recorded on a special form. Engines are

started by compressed air supplied by a motor-driven compressor and stored in three tanks. Exhaust gases from each engine pass out through a horizontal pipe to the individual vertical silencer outside the plant.

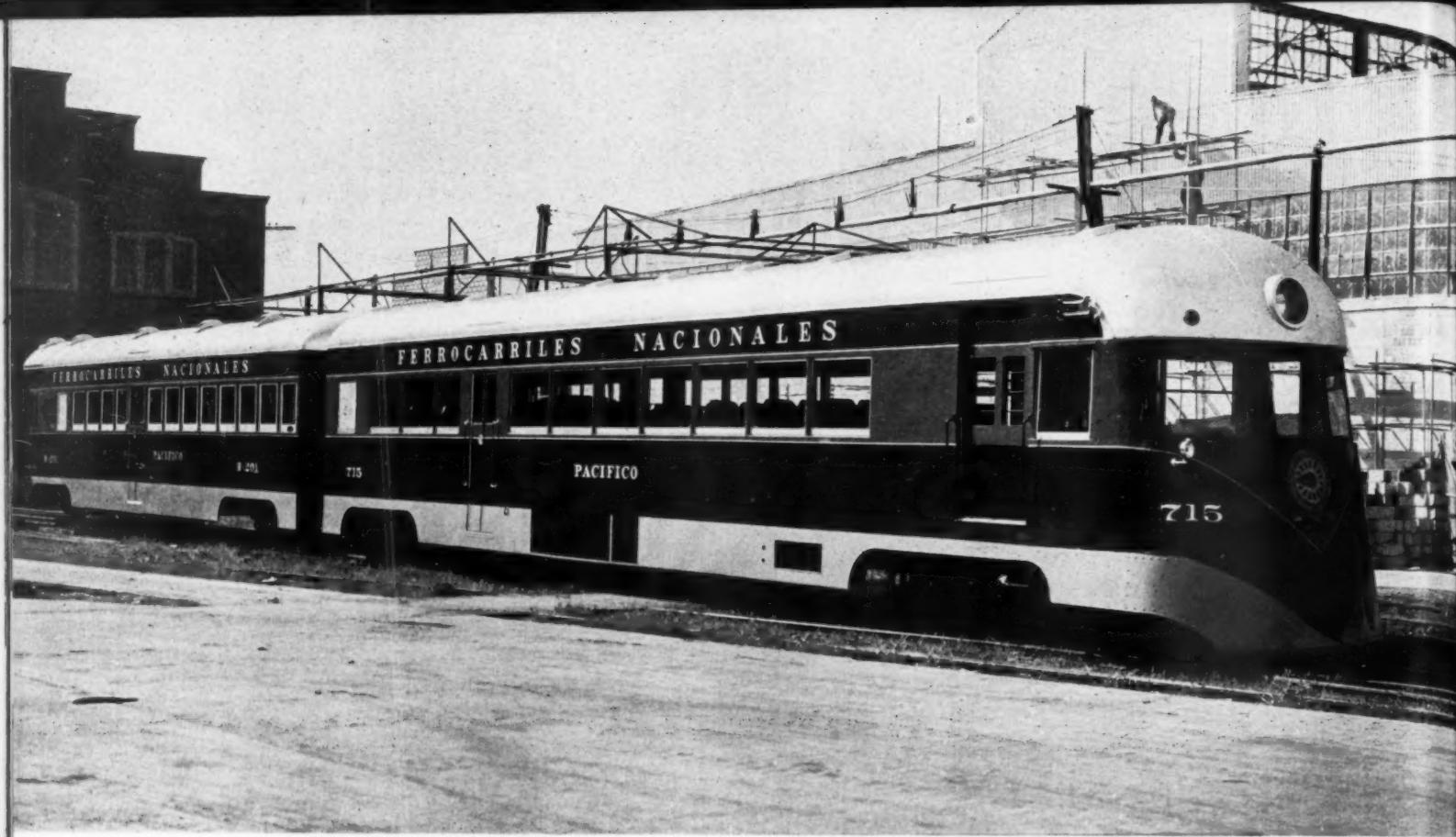
City power is used to operate all the plant's motor-driven auxiliaries. In the event of a failure of this power supply, the plant has a gasoline engine direct-connected to an 18½ kva. generator. This emergency unit is capable of providing enough power for lighting the pumping station, and to operate the Diesel auxiliaries, the rack and shredder, the ventilating fans and a sump pump.

The flood control equipment in the plant consists of two 6-cylinder Sterling gasoline engines, each rated at 180 hp. at 1200 rpm., and each driving through flexible couplings and right-angle gears a 21,000 gpm. centrifugal pump. These units depend upon batteries for starting and an automatic battery charger is included in the plant equipment.

Both sewage and flood pumps are operated from a control table in the engine room. There is a recording gauge showing the level in the intake chamber and an alarm sounds if the level goes too low or too high. A single-panel switchboard holds switches for all the motor-driven auxiliary equipment. There are two removable sections in the engine room floor so that it is possible to use the engine room hoist to handle basement pumps and other equipment and bring them up for repair.

Springfield has met its major problems through foresight in the installation of good equipment. As is common in plants that are prepared for every emergency, there have been no emergencies to face. The plant is doing a hard, continuous, routine job efficiently and at exceedingly low cost.

Of the plant's complete auxiliaries, the spring mountings are Hussman, the flexible couplings Falk, the air filters Vortox, exhaust silencers Maxim, evaporative cooler Buffalo, the cooling water pumps Deming, the oil filters Purolator centrifuge Hydroil, fuel meters Niagara, and fuel transfer pump Roper. Socony supplies the fuel. In addition, there are Alnor pyrometers Edwards alarms, U. S. pressure gauges, Reliance tachometers, a Quincy air compressor and a Wright hoist. The Warren Steam sewage pumps are driven through Farrel-Birmingham gears. The emergency power system is Fair banks-Morse, the starting batteries Exide, and the battery charger General Electric.



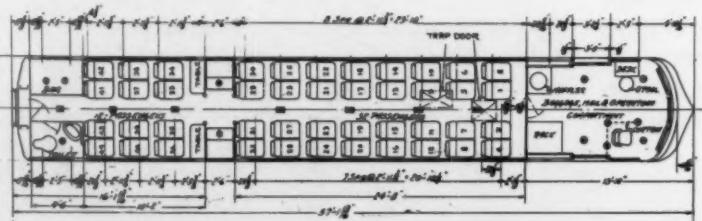
22 MOTORAILERS FOR SOUTH AMERICA

By GEORGE D. CROSSLEY

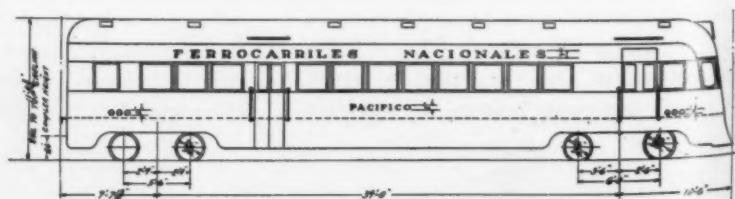
THE American Car and Foundry Company shipped on the maiden voyage of the new Grace Line freighter, *Santa Rita*, which sailed Wednesday, September 24, for Buenaventura, Colombia, South America, the first four units of an order for thirty-five passenger cars for the Colombian National Railways. The total order, which consists of twenty-two Motorailers and thirteen Trailers, will be delivered over the next few months. Some of these cars will

run on the F. C. Del Pacifico out of Buenaventura, others on branch roads out of Bogota. These Motorailers may be operated either as single self-propelled rail motor cars, or a trailer may be coupled on to form a train of two cars. Due to the steep grades and high altitudes which will be encountered on the Colombian National Railways, it was essential that these rail cars be kept as light as possible. The power plant of the Motorailers is a 275 hp. six

cylinder, solid injection, low pressure, electric ignition oil engine, built for the American Car and Foundry Company by the Waukesha Motor Company. The transmission, designed and built expressly for Motorailer use by the Twin Disc Clutch Company, is a hydraulic torque converter which includes a direct drive feature. All of the cars will be styled with a similar color scheme for the exterior—banner blue, cardinal red, and slate gray, with aluminum



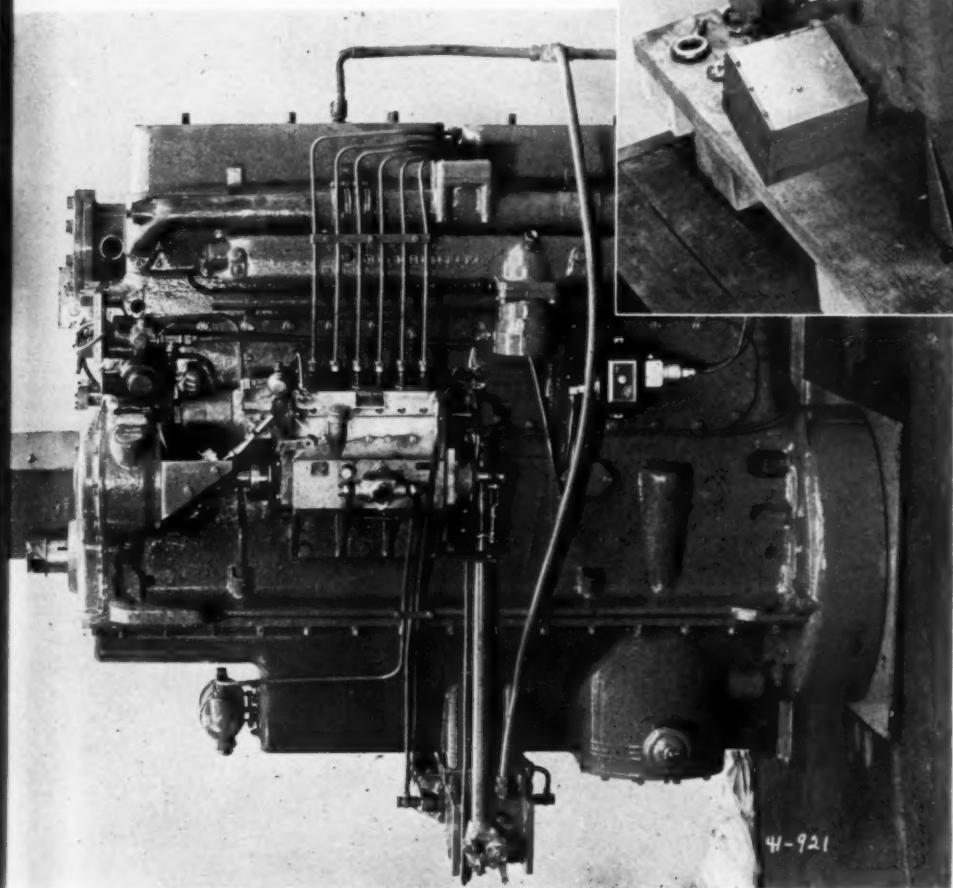
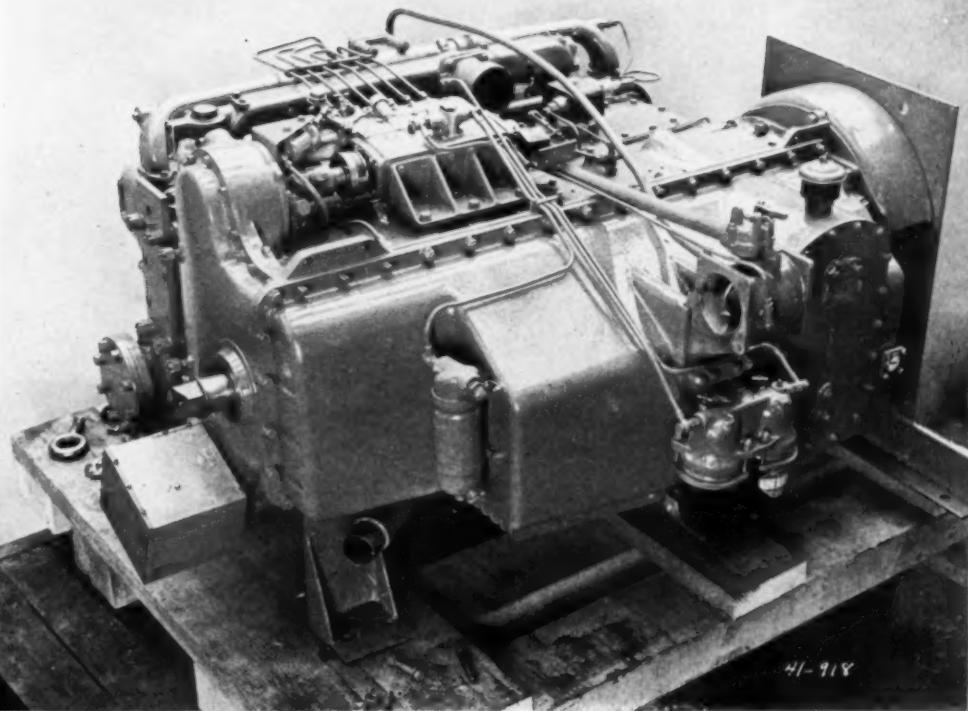
Arrangement plan of the power cars



Side elevation of the power cars

←
This Motorailer and trailer are the first units shipped by A. C. F. on a 35-car order to Colombian National Railways.

End view of the Waukesha-Heselman spark ignition oil engine which powers each of the Motorailers. →



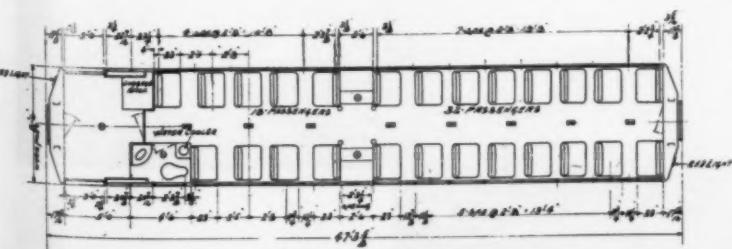
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Injection side of the 6 cylinder, 275 hp. Waukesha-Hesselman engine.

Interior view of the Motorailer, showing the deep cushioned, individual seats and wide, clear vision windows. →

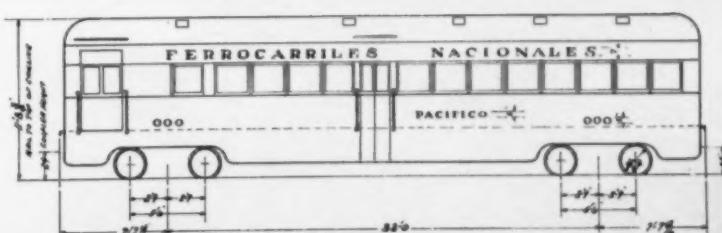


paint on the roof, and gold lettering. The interior will differ—for those cars, which will operate in the warm lowlands, cool color such as blues and greens are used, while those, which will operate in the mountains, have the warmer shades of red and tan. Similar Motorailers of the same company's earlier design and manufacture have been operating with marked success for several years here and in South America. To aid in loading and unloading these cars,

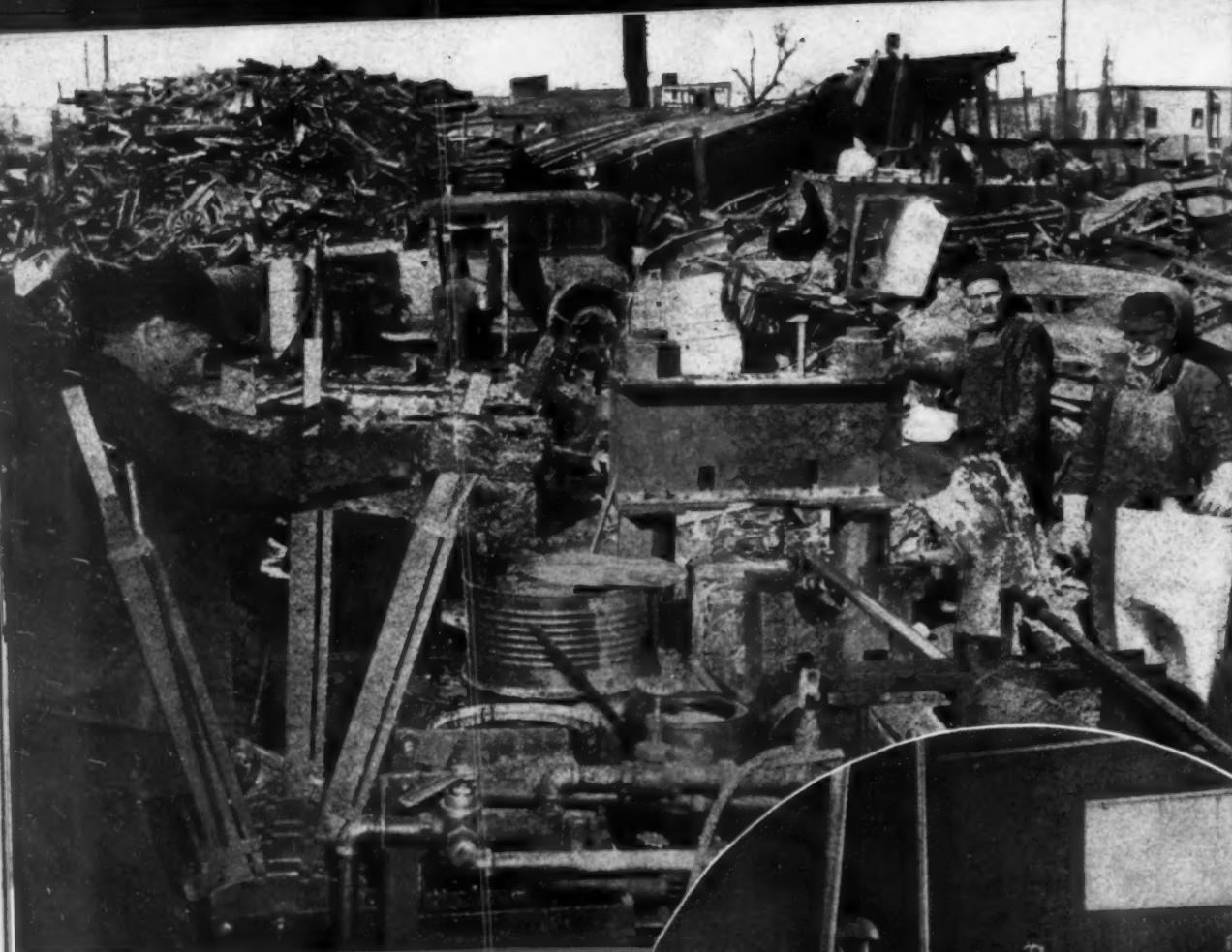
the American Car and Foundry Company has constructed two special loading beams. One of these will be used to load the four Trailers aboard the Grace Line freighter, *Santa Rita*, and will then be taken along to South America to unload shipments as they arrive. Since these cars are too large to be placed in the hold, they will be carried on deck in specially arranged mountings and protected from storm by appropriate housings.



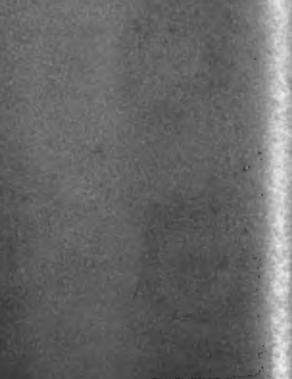
Arrangement plan of the trailers



Side elevation of the trailers



These views show two extensive scrap yards and the Diesel plants which supply power for handling and baling this material which is both bulky and heavy.

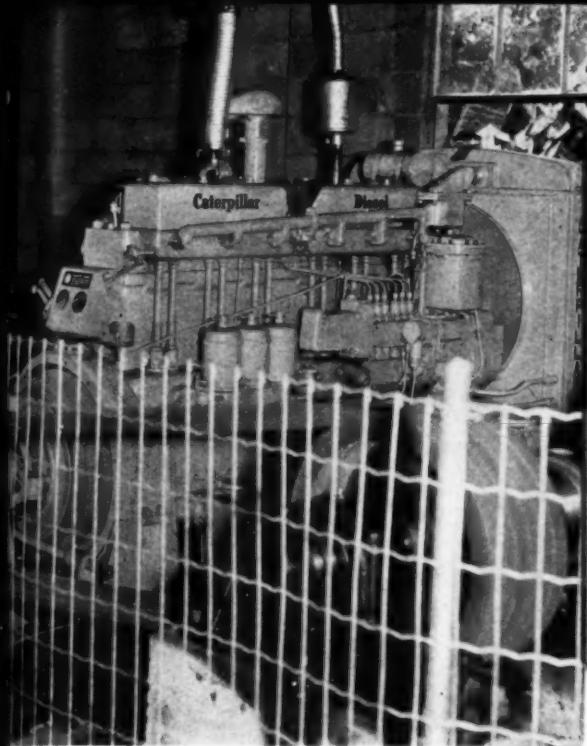


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SCRAP FOR UNCLE SAM'S

NATIONAL DEFENSE

WITH scrap metal at a premium due to the National Defense program, national interest has centered upon conservation of metals.

Reclamation departments of industry are bending every effort toward conservation of metal as the steel shortage becomes more serious, and feverish action surrounds scrap yards these days. Indeed, work in the scrap yards is no longer the mere symbol of an everlasting fight against waste: it has also become the symbol for patriotic conservation that will permit quick furtherance of the country's drive to prepare itself and others against Hitlerism.

It is interesting to note that Diesels are doing their full share in the battle against time and dwindling stocks of material. Itself an outstanding example of economy because of long faithful hours of operation on small supplies of economical fuel, the Diesel engine is driving scrap iron presses, cutters, compressors, hydraulic pumps, shears, pulverizers and scrap elevators in yards throughout the land.

There was a time when scrap yards simply piled their materials into freight cars and shipped it to foundries and steel mills. The modern way is to bale it first—for good, sound, business reasons. Baling converts a poor grade of loose, light scrap of little value into compact, heavy scrap that commands a better price. Such bulky but light material, as automobile fenders and bodies for instance, is undesirable because it is hard to handle. It is also costly to ship. Freight car rates are the same, whether the car

is filled with separate, space-taking material or loaded with compact, heavy bales.

Diesels permit scrap yard owners to avail themselves of the opportunity to increase their profits and, currently, to supply better scrap with less delay during the national emergency. For years Diesel engines have furnished power necessary for baling scrap. Now these Caterpillar Diesel-generating sets are also doing their share in that field.

At the Consumers Steel & Supply Co. of Racine, Wisconsin, for instance, three Diesel-electric sets furnish power to operate two ten-ton overhead cranes, 80 feet span, 420 feet runways; a Logemann Bros. hydraulic press; six shears and a pulverizer for crushing and turning. This company produces 6,000 tons of baled and straight scrap iron per month with its Diesels operating around the clock daily.

The Alter Co., of Davenport, Iowa, uses a Diesel engine to drive a Gardner-Denver compressor and Logemann hydraulic pump and press with triple compression. It is also used to power the elevator which carries baled scrap to railroad cars. In operation twenty-four hours a day, the D11000 uses about fifteen cents worth of fuel per hour.

Then there's the M. Kimerling & Son Scrap Yard in Birmingham, Alabama, which uses a Diesel engine driving a Gardner-Denver compressor furnishing power to drive a Galland-Henning metal baling press. From thirty to

forty bales of pressed scrap iron are produced per hour and the engine operates sixteen hours a day on less than thirty cents worth of fuel per hour.

Still another is the Doan & Link Yards near Ocala, Florida, where a Diesel engine drives a scrap iron press and cutter, producing a total of 250 bundles, each weighing 200 pounds, during a nine-hour day. Ten gallons of 8½ cent fuel are consumed.

The Orlando Bag & Metal Works at Orlando, Florida, use a Diesel engine to drive a 7x6 compressor supplying power to drive a Galland-Henning metal baling press. This engine is in operation sixteen hours daily on about 2½ gallons of fuel per hour. From thirty to forty bundles of pressed scrap iron per hour are produced.

Union Scrap Iron & Metal Co., Minneapolis, Minnesota, made an exhausting investigation before selecting a Diesel. Glowing answers to their questions, received from Diesel users, led them to look for fine performance from the Diesel engine they purchased. It not only proved a great money saver, but is doing even better work than the owners expected. This engine drives a Logemann Bros. pump on its scrap press, baling from three to five tons of scrap iron per hour. The engine is in operation from eight to sixteen hours a day on 2.15 gallons of 7.2 cent fuel per hour. Before installing their engine Union Scrap Iron & Metal Co. found that the power company estimate was \$147. The cost of operating the Diesel engine has been but \$40 per month!

These examples tell, in part, why scrap yard owners are choosing Diesels. There is no scrap to bale scrap with speed and economy when Diesels are on the job!

OVERHAULING YOUR DIESEL UNITS

Part 2.

By R. L. GREGORY*

In the November issue of DIESEL PROGRESS, the writer discussed the necessity and advisability of an annual inspection and overhauling of your plant units and the steps preparatory to such a program. With the unit dismantled to the stage given, the work of inspection and repair can be continued.

Cylinder Heads

THE cylinder heads containing the fuel valves and their component parts should be carefully inspected. In this inspection of each head, the fuel valve assembly should be removed and dismantled so that the flame plate, atomizer assembly, the needle valve, and the valve seat can be inspected. The flame plate should be thoroughly cleaned, all foreign matter and scale removed, and the aperture checked for wear. If the plate shows appreciable wear, a new one should be installed. If there is no great amount of wear, it may be used again after a thorough cleaning. The atomizer assembly should be dismantled, so that the cone, the individual rings, and the spacers can be cleaned. All scale should be removed, with particular attention given to the small passages in the rings. These passages will become coated with a thin hard scale and, unless this scale is removed, it will continue to build up and lessen the passage of fuel.

The needle valve and the valve seat should be thoroughly examined and cleaned up to ascertain the amount of wear. The point of the needle valve becomes scaled over but, by using a good grade of fine grinding compound, the valve and seat can be cleaned and ground in, unless too badly worn, in a short period of time. Often you will find that the point of the needle valve has been chipped or worn excessively, or the valve stem shows excessive wear at the point of contact with the valve stem packing. If either of these conditions appear, you will encounter, in the first instance, an excess passage of fuel past the needle valve and, in the second instance, a tendency for the needle

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

valve to stick and a leakage at the packing gland. In either case, the needle valve should be renewed. These conditions, however, generally occur after long periods of operation, unless you are using a low grade of fuel which contains a foreign substance of an abrasive nature not entirely removed by either your strainers or centrifuge. In such a case, I have known of instances where the needle valves had to be renewed very frequently.

The check valve in the fuel line should be cleaned and inspected and all piping also inspected and cleaned. The water passages in the cooling portion of the cylinder head should be inspected to ascertain if any undue scaling or oxidization is taking place. When this work has been completed, the various parts can then be reassembled and work started on the next head. This work, however, should be either done by a workman thoroughly familiar with the fuel valve assembly or under the supervision of one thoroughly familiar with it. I might further suggest that, in your annual overhaul, you repack all fuel valves with new packing. Experience has shown us that the best results are obtained by using a good grade of specially designed packing, containing a neoprene binder. This gives longer life to your packing with a minimum of wear on the valve stem. While some workmen have been engaged on the foregoing work, others have removed the pistons and have been cleaning them up for inspection.

Pistons

With the pistons removed and cleaned up, remove the old rings and keep them in sets with their identity intact. As a set of rings is removed, clean them up and check them for wear, keeping a complete record of each ring of each set. You will find, in checking these rings, that the greatest amount of wear occurs on the top rings and diminishes as they go down the grooves. Some engineers make a practice of removing rings which appear to be in good shape with a minimum of wear from the lower grooves to the top grooves, claiming

this to be economical, and minimizing the installation of new rings.

The writer feels this to be false economy, however. Any ring, subjected to several thousand hours of operation in a lower groove with a minimum of wear, regardless of its apparent good condition, has lost a certain amount of tension and tensile strength. By moving it to a higher groove on the piston head where the conditions to which it will be subjected are more severe, therefore, you are just inviting trouble. It appears that it would be much more economical to install a complete set of new rings and keep the ring in question for emergency repair in a lower groove, or if conditions are such that you must use it, replace it in the groove from which it was removed. The purpose of an annual inspection and overhaul is to place your engine in the best possible condition: The proper procedure is to install a set of new rings and retain the old ones in good condition for emergency repairs.

In fitting a new set of rings to a piston, have the grooves well cleaned, free from any carbon or residue; be sure that there are no shoulders or burrs in the grooves and, above all, keep a complete record of the new rings installed for future checking. This record should contain the following information: Ring identity, such as 1-A (top ring on #1 piston), manufacturer, gap clearance, tension, date of installation, hours of operation, wear per thousand hours of operation, condition of ring and disposition; that is, whether reused, kept for spare, or discarded. With this information, each ring can be easily checked at the next inspection. As you fit up and install new rings, give them an identification number. For instance, if you are rerung #3 piston, take a set of small steel clamps and on the top side of your rings mark them 3-A, 3-B, 3-C, etc., starting with the top ring and working down. The cut in Fig. 1 shows a piston which has been cleaned, rerung, and ready for reinstalling And now please turn to page 9

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Low-Speed Machines Now Balanced on Own Pedestals

LOW-SPEED machines, such as waterwheels and Diesel-driven generators rotating at as low as 100 rpm, may now be dynamically balanced on their own pedestals. This extension of the balancing range from the previous limit of 600 rpm, has been made possible by means of a new pick-up, developed by Westinghouse engineers, which indicates vibrations of double amplitude as low as 0.003 inch at 100 rpm, the lower limit of its field of use. The newly developed pick-up is used with a standard portable balancer and conventional sine-wave generator.

To balance rotating machines in their own mounting, and under operating conditions, it is customary to resort to a scheme in which a wattmeter is used to measure both the magnitude and the phase angle of the vibrations caused by unbalance in the rotor. A pick-up held against the frame of the machine translates the vibrations into voltages that are impressed on the potential coil of the wattmeter. The current coil is energized from a sine-wave generator coupled to the rotor being balanced.

The phase angle between the current and the voltage in the wattmeter can be made to equal 90 degrees and its indication made to equal zero by rotating the stator of the sine-wave generator. This position is a measure of the phase angle of the unbalance vibration. Shifting the phase of the generator 90 degrees from this zero position gives a maximum reading in the wattmeter. This reading is a measure of the amplitude of the vibrations. With the magnitude and phase angle of the unbalance vibration known, it is relatively easy to compute the proper balancing weights.

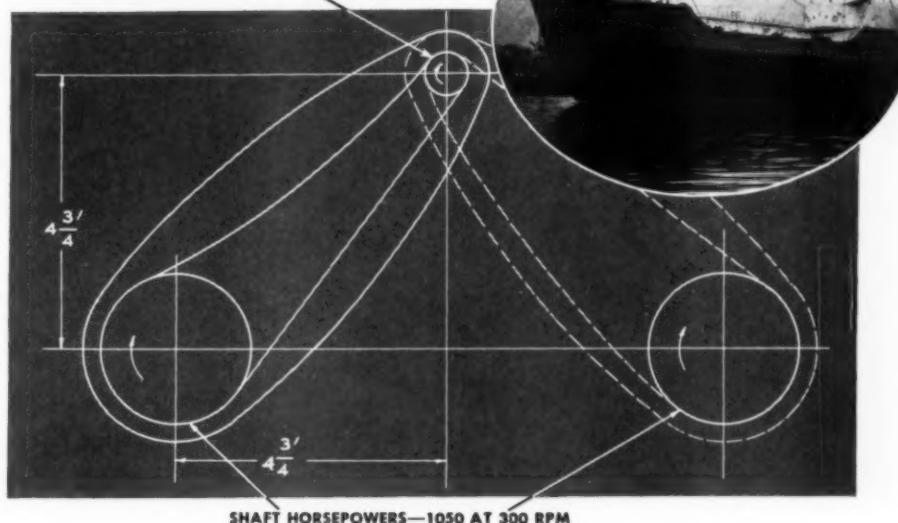
The difficulty with low-speed balancing has been that a pick-up capable of measuring vibrations of low frequencies must have much lower natural frequencies than the vibrations measured. To furnish correct indication, a vibration pick-up and its mounting should have a natural frequency of no more than one-half the frequency of vibration of the machine to be balanced. Thus, for a 100 rpm. generator, for example, the natural frequency of the pick-up must be not more than 50 cycles per minute. To get a body with such a low frequency has therefore meant the use of large masses, making the instrument unwieldy to handle. The new pick-up employs something like an inverted pendulum. The frequency of an ordinary pendulum, operated by gravity, can be lowered by lengthening its arm — the way a

grandfather's clock is regulated. Similarly, the natural frequency of an inverted pendulum can be made extremely low by weakening the restoring springs so that it is barely stable in a vertical position. To permit the use of this pick-up in all directions, the effect of gravity has been eliminated by laying the pendulum on its side, and the force previously supplied by gravity is furnished by a toggle-like spring mechanism attached to the pendulum.

CITY of North Vancouver, B. C., has awarded a contract amounting to \$113,958 to the West Coast Salvage & Contracting Company, Ltd., for the construction of a new passenger and automobile ferryboat which is to be equipped with an eight cylinder, double end Union Diesel engine developing 360 hp. This boat will be 150 ft. in length, 44 ft. beam, and 12 ft. deep and have accommodations for 600 passengers and thirty automobiles.

On the VICTORIA

SHAFT GENERATOR—350 KW—523 HP—1200 RPM



Diamond Roller Chain Drives For the Shaft Generator

Arranged to be operated from either of two 1050 H.P. Diesel engines, the shaft generator on the new Victoria is driven by Diamond Roller Chains at 1200 r.p.m. On drives of this kind, the smooth running, long life and low maintenance costs of DIAMOND Chains make them ideally suited. They do not slip or creep, have high tensile strength and great reserve power.

Their split-second accuracy is well estab-

lished since leading designers and builders of Diesel engines regularly use them for timing drives and for the operation of fuel, lubricating oil and water pumps. DIAMOND Roller Chains are adaptable to any type of equipment—for transmitting power up to 1500 H.P. Our engineers welcome the opportunity of cooperating with you. DIAMOND CHAIN & MFG. CO., 407 Kentucky Avenue, Indianapolis, Indiana.



Aluminum Company Expands

TO supply stock for the manufacture of forgings for airplane motors and fittings, and rod, bar and wire for national defense industries, R. T. Whitzel, superintendent of the Massena, N. Y., works of Aluminum Company of America, has been advised that the company plans to erect a second blooming mill here. Early in September, OPM stated that this expansion was essential to defense.

The blooming mill and its necessary facilities

will be housed in steel and brick buildings covering an area of more than 450,000 square feet. A completely new melting department will be established to serve the blooming mill.

The mill and buildings are now being designed by the company's engineering department in Pittsburgh and will be erected by the company's own construction forces. The grading of the site has already started and the company is exerting every effort to speed delivery of materials and equipment, Mr. Whitzel said.

The blooming mill now being developed for location here as well as the present blooming mill may be considered the mother plant of the Aluminum Company's entire forging operations, according to Mr. Whitzel, since 60% of their output will be used in making forging stock. Airplane rivets are another important defense item whose manufacture begins in Massena in the blooming mills.

Largest of the buildings for the new mill will be approximately 160 feet by 1400 feet. The buildings will be similar in design and construction to the present blooming mill buildings; while the mill itself will be of the latest type and have incorporated in it the improvements resulting from the company's past experience in blooming mill operations.

Mr. Whitzel estimates that the mill will cost in excess of \$15,000,000. This, he said, is over and above the company's \$200,000,000 self-financed expansion program for national defense.

Supervising and Operating Engineers' Section

Continued from page 54

Twin Disc Torque Converters Give Colombia's New Railcars smooth starting and rapid acceleration

Due to the converter's torque multiplication characteristics, a compactly designed, pancake-type, internal combustion engine of moderate horsepower is being used with outstanding success in railcar installations.

This combination couples operating economy with ideal performance. The car is started smoothly . . . the acceleration is extremely rapid and the simple shift to direct drive for normal propulsion provides the maximum in efficiency and flexibility. Bulletin 132 gives a complete description of Twin Disc Hydraulic Drives. Write for a free copy on your business letterhead. TWIN DISC CLUTCH COMPANY, 1345 Racine Street, Racine, Wis., U.S.A.

The Twin Disc Torque Converter is bolted directly to the engine flywheel housing and flywheel, and the power developed by the 275 hp. Waukesha Hesselman engine is transmitted from the converter direct to the axle by means of a flexible drive shaft.

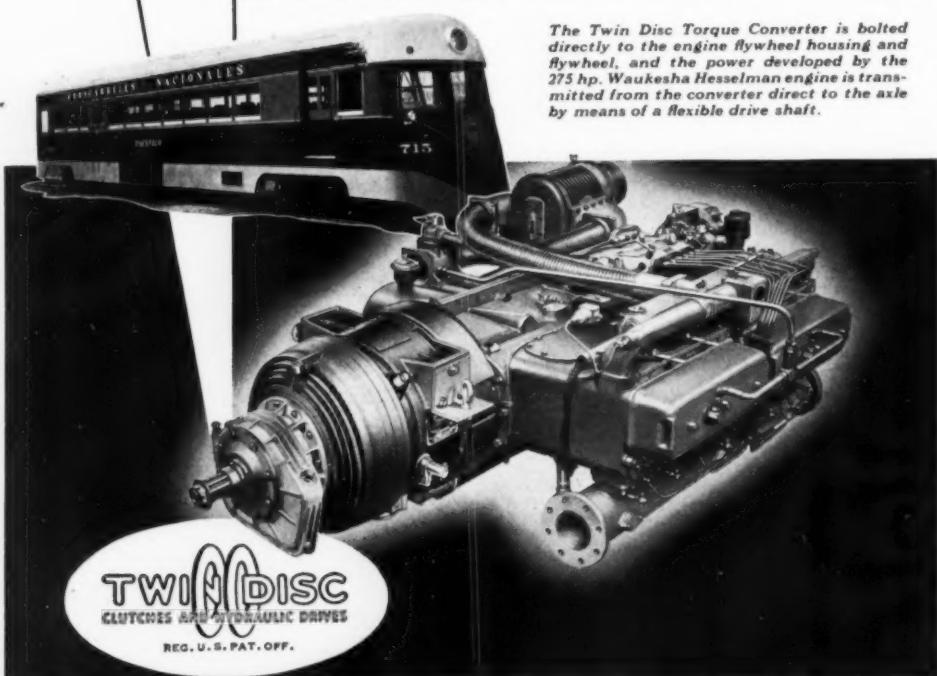


Fig. 1

Liners

One of the most important parts of your inspection has to do with the liners, since they take the brunt of the wear, and the economy which you expect to get from your engine depends a great deal on their condition with relation to the rings and pistons.

We are all familiar with the fact that any unit after a few months' operation will have two shoulders develop at the top stroke of the piston on the liner wall. The minor shoulder develops at the top stroke of the piston head, while the more pronounced one develops at the top stroke of the top ring. The extent of the protrusion at these points naturally de-

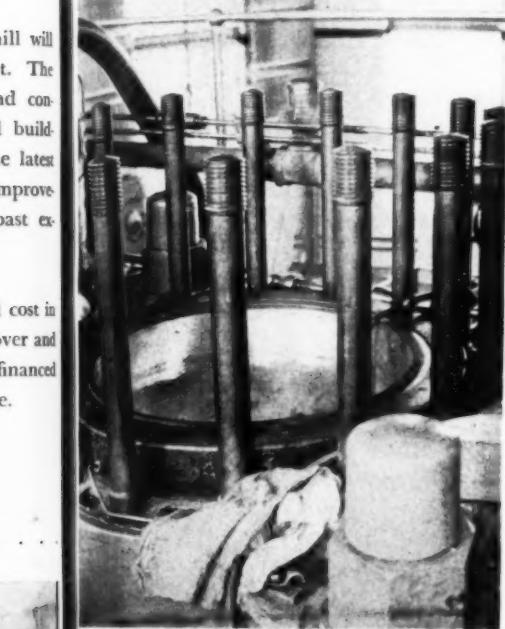
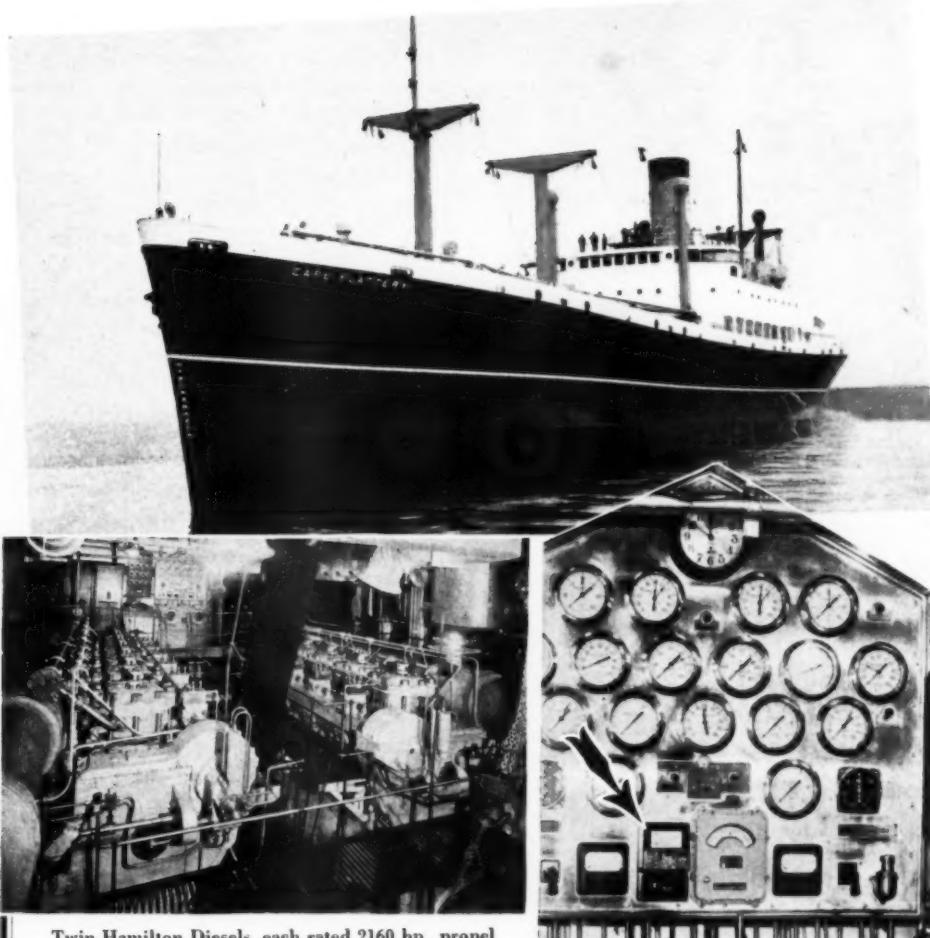


Fig. 2

pends upon the hours of operation, lubrication, ring conditions, etc., their being the result of liner wear at that point of piston travel.

Now, a slight shoulder of a few thousandths at these points is not objectionable, but after a few thousand hours of operation, even with the best of attention, they do become quite pronounced. If the liner wear has covered a long period of operation, it is often necessary to renew these liners, or on the smaller units re-bore the liner and fit with oversize or special rings. But, if the wear is just the normal result of operation, these shoulders can be effectively removed by a little careful work combined with a little ingenuity on the part of those in charge. The most effective way would be by means of a boring bar, but many plants do not have this equipment. If not available, then one can use a small high speed motor, equipped with a flexible shaft four or five feet in length, and a good grade of emery wheel. If this is not available, you can use an air-motor. With any of this equipment, you can rough out these shoulders, periodically checking your grinding with a trisquare from the top of the liner, so that you do not grind too deeply. When you have the shoulder pretty well roughed out, you can finish the job by



Twin Hamilton Diesels, each rated 2160 hp., propel each of the five C-1-B Maritime Commission cargo ships recently completed at the Seattle-Tacoma Shipyards. Both main and auxiliary Diesels are Alnor-protected.

Alnor Pyrometers protect the Diesels in five C-1-B cargo ships

Five identical cargo ships—typified by the "Cape Flattery," shown above—have been completed in record time by the Seattle-Tacoma Shipbuilding Corp. from the U. S. Maritime Commission's C-1-B designs. These ships are characterized by yacht-like lines and are the ultimate in mod-

ern and complete equipment. Each ship is completely Dieselized—with a pair of Hamilton main engines and a pair of Washington auxiliary engines—and all twenty Diesels in the five ships are Alnor-equipped for protection and assurance of efficient performance.

*Buy or specify "Alnor"
Ask for catalog*

 **Illinois Testing Laboratories Inc.**

423 NORTH LaSALLE STREET, CHICAGO, ILLINOIS

Manufacturers of "Alnor" and "Price" Instruments—Products of 44 Years' Experience

using first a medium grade of carborundum stone and then finishing with either a real fine grade of carborundum or oil stone. You can obtain from most abrasive material manufacturers stones made up with one surface the arc of the diameter of your liner. These can be procured at a reasonable cost. By finishing the job with such a stone, you can put a good polish on the liner and finish it to within a very few thousandths of a perfect circle in a limited space of time. Fig. 2 shows this shoulder re-

moved by the above method, where no boring bar was used. The finished job on this particular liner did not vary more than .003" in diameter and had time permitted could have been lessened.

You will find that by removing these shoulders you will not only have a smoother running unit, but will eliminate some of the wear and tear to your new top ring. In doing this job, one important thing should be remembered:

Block off both the intake and exhaust ports with rags, in order to keep the grindings from entering these ports. Also make a good covering which can be placed in the bottom of the liner, to keep the grindings from falling into the crankcase or crank bearings. This can be easily held up by the bolts which hold your wiper ring assemblies to the bottom of the liner, since you have already removed them for cleaning and inspection. The work of grinding of these shoulders should be done by a mechanic having proper knowledge of grinding material so that it can be kept as near uniform as possible.

Upon completing this work on one liner, the equipment can be moved to the next liner. The rags in the ports of the completed one should then be removed and the carbon thoroughly cleaned from the ports. When this has been done, the liner should be washed down with kerosene to remove any trace of grit and the covering removed from the bottom of the liner. With the wiper ring assembly cleaned as well as the liner, reinstall the wiper ring assembly and then check the lubricating ports in the liner walls. There are usually five or six of these ports, each fed by a separate line from the lubricators. Work your lubricators by hand and see that the lubricant flows freely from all ports. If it appears to be sluggish in flow, ascertain the reason. There may be dirt in the oil line; the check valve, of which there is usually one in each line, may be gummed up or the lubricator itself may not be functioning. In any instance, make sure that an ample supply of oil is forthcoming at all ports. When this has been accomplished you are ready to reinstall the piston in this cylinder.

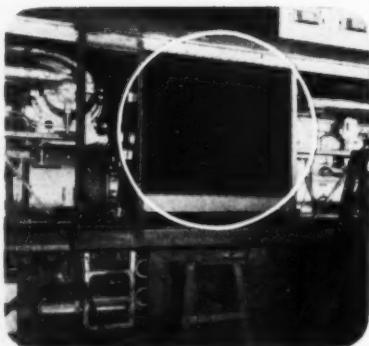
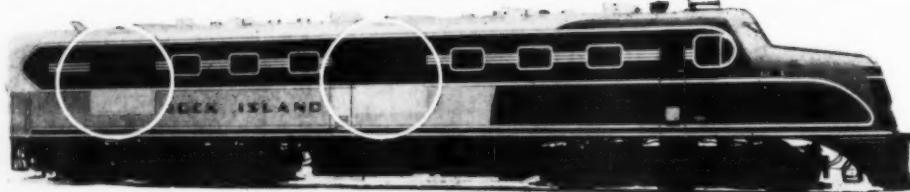
The progressive stages of the annual inspection will be continued in next month's issue.

Norman E. Donnelly Appointed

THE Buda Company is pleased to announce the appointment of Mr. Norman E. Donnelly as our Marine Sales Manager. Mr. Donnelly is well known in the marine trade, having just recently completed seven years with the Caterpillar Tractor Company as their Eastern Engine Sales Manager. Prior to his association with the Caterpillar Company, he was a partner for twelve years in the Dawn Boat Corporation, New York City. Two years he worked at the Donnelly Dry Dock Corporation in New York. He served two years during the war with the United States Navy. He is a graduate of Cornell University in Mechanical Engineering (Class '19). Mr. Donnelly succeeds Mr. Frank Flick who formerly was with our organization in that capacity.



Speaking of Specialized Cooling Jobs



Specially designed radiators for maximum cooling efficiency of both water and oil mounted on both sides of locomotive. Propeller type fans in the roof draw air through the radiator and exhaust it to the outside.

A FEW OF MANY WELL-KNOWN USERS OF YOUNG PRODUCTS

American Locomotive Company
Baldwin Locomotive Works
The Buda Company
Chicago Pneumatic Tool Company
Waukesha Motor Company
Electro-Motive Corporation
Marmon-Herrington Company, Inc.
Le Roi Company
Sullivan Machinery Company
Boeing Aircraft Company
Douglas Aircraft Company, Inc.
Brewster Aeronautical Corporation
The Whitcomb Locomotive Co.



EMCO Executives Called for Military Service

THREE executives of the Pittsburgh Equipment Meter Company have recently been called for active military duty in different branches of the service.

Colonel W. F. Rockwell, President of the company, was called for extended active service early in October, reporting to Washington, D. C. where he has been serving as Assistant to the Chief of the Motor Transport Division. Captain A. E. Higgins, Vice President of the company, originally called in mid-summer for active duty in the Air Corps, has been temporarily deferred due to certain National Defense activities in which the Pittsburgh firm is engaged.

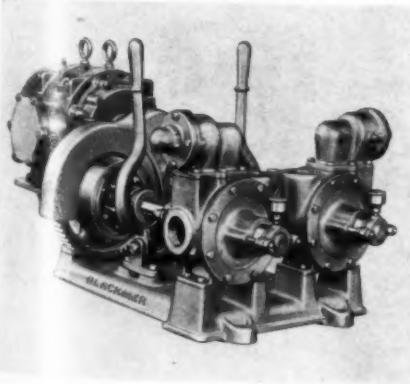
For the past eight months, Captain J. R. Sproat of the Sales Staff has been serving with the 176th Field Artillery in command of Battery "F" at Fort Meade.

FOR DEFENSE



ON SALE AT YOUR POST OFFICE OR BANK

Blackmer Announces New Duplex Unit



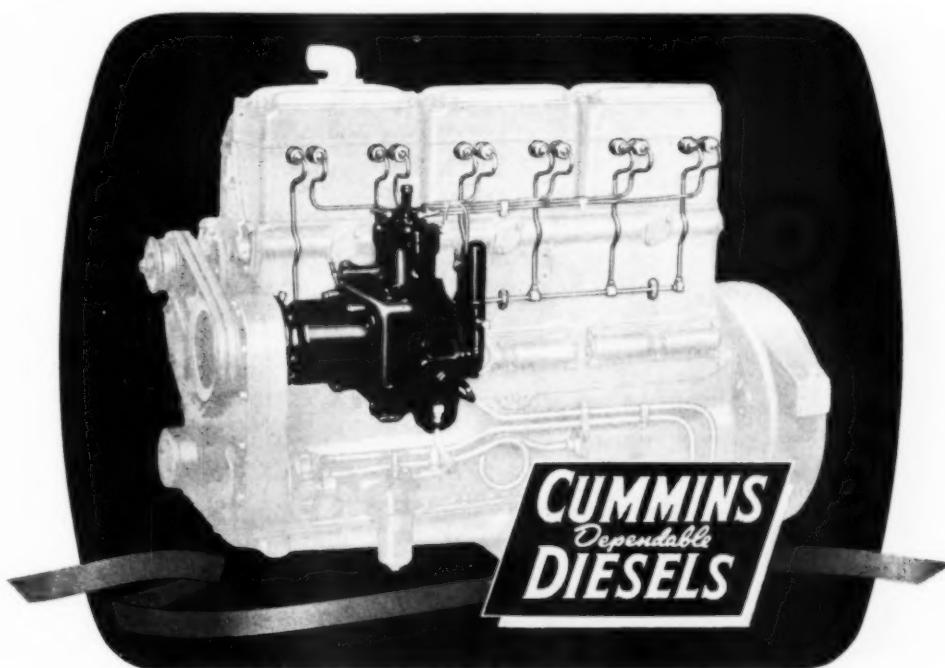
FIRST shipments of the new 50 gallon Blackmer Duplex Pumping Units have just been made according to an announcement by

J. B. Trotman, General Sales Manager of the Blackmer Pump Company, Grand Rapids, Michigan.

This new duplex unit was developed for use in bulk stations, blending plants and refineries—it also has many applications in the industrial field for handling naphtha—tar—printing inks—and similar liquids and semi-liquids. In fact the pumps will handle practically anything that flows through pipes. It is an ideal unit where two different liquids are to be handled by the same pumping unit or where temporary higher

capacity is required. Or it may be operated as a single unit or both pumps may be operated together.

The pumps are standard Blackmer "Bucket Design" (swinging vanes) with newly developed streamlined inlet chamber which permits the handling of liquids of greater viscosity without any lowering of the volumetric efficiencies. New design built-in relief valves (optional equipment) will handle the full capacity of the pumps without shock or end-thrust on the working parts of the pump. Extremely quiet



Exclusive . . . in design and manufacture . . . in performance and protection

The Cummins Diesel's outstanding record is a perpetual demonstration of the value of the *Exclusive Cummins Fuel System* . . . without it, the Cummins Diesel would be just another diesel. But because it is fundamentally different from all other fuel systems . . . every Cummins Diesel owner enjoys these three exclusive advantages:

1. *Efficient distribution* because fuel is under low pressure and controlled from one point.
2. *Efficient combustion* because fuel is gasified before injection and controlled during injection.
3. *Efficient service* because neither pump nor in-

jectors need be sent to the factory for overhaul . . . but can be serviced in the field by a competent mechanic with the aid of the Owner's Manual.

The Cummins Fuel System was designed exclusively for the Cummins Diesel . . . it is manufactured exclusively by the Cummins Engine Company . . . it is used exclusively in the Cummins Diesel . . . it gives you that dependable performance which is your protection against interrupted operation . . . it is your assurance of increased production and profits on your job. Bulletin FS-101 tells the whole story. Write for your copy.

Cummins Engine Co. • Columbus, Ind.

— no chatter — even when used with pre-set meters and quick closing valves.

Pumps can be furnished with or without removable liners, or for extremely viscous liquids steam-jacketed heads are available. The Blackmer Engineering Department recommends that pumps with removable liners be used for applications where corrosive liquids, or liquids having mild abrasives in suspension are being handled. The low cost of liner replacements represent substantial savings in maintenance expense. Unlined pumps are widely used in

the petroleum industry for handling liquids that do not have abrasive properties.

The general specifications of the new Blackmer Duplex Units are as follows: Capacity: 50 GPM per pump, 100 GPM with pumps operating simultaneously. Pressure: 100 psi. with lubricating liquids; 75 psi. with non-lubricating liquids. (Units with operating pressures up to 300 psi. and for capacities to 700 GPM are also available). Bearings: pumps for 75 lb.-100 lb. pressures are furnished with double sleeve bearings, which eliminate shaft distortion. Both

bearings are sealed against pumpage by ample packing. Pumps for 125 lb.-300 lb. pressures are equipped with anti-friction bearings, either internal or external, depending upon service requirements.

Fluid Couplings, Traction

HYDRAULIC Coupling Division of American Blower Corporation announces Bulletin 4619 illustrating and describing Traction Type Fluid Couplings for electric motor and Diesel engine applications. This is a fifteen page booklet carrying color illustrations and explanation of the construction and operating principles of Fluid Drives in terms that anyone can understand. Torque curves, horsepower-speed charts, and dimensional tables are also given as guides to the selection of Fluid Drives for a wide range of applications. An unusually complete and attractive bulletin. Write for your copy to American Blower Corporation 6000 Russell Street, Detroit, Michigan.

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Luber-Finer Helps Conserve Nation's Oil Supply

As Recommended by U. S. Government

Model 135-S

"Don't change your oil except seasonally."

"If you don't have an oil filter, get one installed; it will save your engine, oil bill and the nation's supply of oil."

These are suggestions to motorists by the Consumer Division of OPACS to conserve oil and prolong car life.

LUBER-FINER, A Genuine Oil Refiner, Saves on Oil Drains and Repairs. Adds Thousands of Miles to Both Oil and Engine Life

A Luber-finer is not just another fabric filter but is a genuine oil refiner employing special refining materials recognized by leading oil companies the world over. With Luber-finer refining packs replaced at proper intervals, it adds extra life to both oil and engines by keeping lubricating oil clean and free from excessive contaminants and acids hour after hour—REGARDLESS OF THE DRAIN PERIOD.

In addition to the Luber-finer Standard Refining Pack for all installations, Luber-finer offers the special DIESELPAC for use with COMPOUNDED OILS. There's a Luber-finer model designed to fit every industrial engine. Write for descriptive technical bulletin.

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REFINES OIL EVERY MILE AS YOU DRIVE

SAVES OIL FOR DEFENSE * SAVES MONEY FOR YOU



George J. Haislmaier

Mr. Haislmaier, a graduate of Marquette University College of Engineering, has been with Young Radiator Company since 1936 and until his most recent promotion, had served as Assistant Sales Manager and Government Specification Engineer of the company's Contract Division, which includes the manufacture of heat exchangers, automotive radiators, jumbo water coolers, and other types of heat transfer

by ample products for transportation, industrial and military purposes. After his graduation, Mr. Hiltmaier spent several years in civil engineering and construction work before joining the young Radiator Sales Department.

Mr. Hilt, who has been serving as Contract Division Sales Manager, in addition to his duties as Vice-President will now devote his entire time to the further development and coordination of the rapidly increasing volume of contract work being handled by the company for military and defense needs.

Three New Engine Bulletins

THE National Supply Company, Superior Engine Division, has issued Bulletins 135, 137 and 136 covering its line of $8\frac{1}{2}'' \times 10\frac{1}{2}''$ stationary, $12'' \times 15''$ stationary, and $12'' \times 15''$ marine diesel engines respectively. These bulletins are complete as to construction details, dimensions and specifications of the three sizes and types of Diesels. Copies of any one or all three Bulletins may be secured direct from The National Supply Company, Superior Engine Division, Springfield, Ohio.

★ ★ ★

"STAG HOUND," the third of a series of five C-2 type cargo ships being built at the Sun Shipbuilding and Dry Dock Company, was launched at Chester, Pa., October 18. This vessel was sponsored by Miss Katharine Carroll Woodward, daughter of the U. S. Maritime Commissioner Thomas M. Woodward. The first two of these boats were christened "Lightning" and "Surprise" and these names were originally used on clipper ships. Likewise "Shooting Star" and "Sea Serpent," the names for the other two boats which will be launched December 6 and January 14.

The "Stag Hound" is a motor vessel 474 ft. long, 63 ft. beam, and will be registered at approximately 8800 gross tons. She has a general cargo capacity of 516,600 cu. ft. and 28,150 cu. ft. refrigerator space. Her normal speed is sixteen knots. This boat, like the others, will be placed in the United States Lines' Far East-Australia service under the house flag of its subsidiary, the American Pioneer Line.

★ ★ ★

TWO 68 ft. Diesel tugs for the Panama Canal Division of the U. S. Engineer Department have been ordered from the Lester F. Alexander Co. of New Orleans, Louisiana.

L. H. Lund Elected Westinghouse Treasurer

L. H. LUND, of Pittsburgh, was elected treasurer of the Westinghouse Electric and Manufacturing Company, by the board of directors, effective November 1. He will succeed L. W. Lyons who retires next month after 38 years' service with the Company.

Mr. Lund has been employed by Westinghouse since January 1921 when he was hired as a temporary employee in the accounting depart-

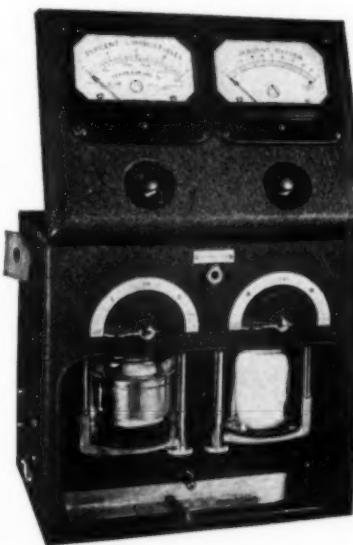
ment of the Westinghouse Electric International Company in New York City. Six months later he was elected auditor there, and since April 1937 he has been assistant treasurer and assistant secretary located in Pittsburgh.

Born in Brooklyn, N. Y., in 1897, he attended public school in Brooklyn and studied accounting at Pace Institute, New York City. Prior to the World War, Mr. Lund was an accountant with Paramount Pictures and a traveling auditor for the Triangle Film Company. He served

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Heat-Prover Service is now available to users of Cities Service Industrial Fuels and Lubricants. This is an economy measuring service which you can secure in addition to the quality and economy advantages offered by Cities Service's SERVICE PROVED Fuel and Diesel Oils.

The Heat-Prover is an ingenious device—a by-product of our research in metallurgy. It registers continuously and instantaneously changes



in the amount of oxygen and combustibles in furnace gases. It is an excellent guide in adjusting 4-cycle Diesels and for combustion control in heat generating plants. In the heat treatment of metals, it is invaluable. It assures uniformity and reduces scrap losses.

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Quincy Compressor Co.'s entire organization—research, engineering, manufacturing, finance—is devoted exclusively to the designing and building of air compressors. This policy of specialization has resulted in a complete line of Quincy Compressors famous for their dependability and efficiency. Quincy Compressors are designed for Diesel starting services requiring pressures up to 500 lbs. per sq. inch. Available in a wide variety of mountings with either gas engine or electric drive or a combination of both. If you have compressed air problems in connection with defense work, ask a Quincy Specialist to make recommendations.

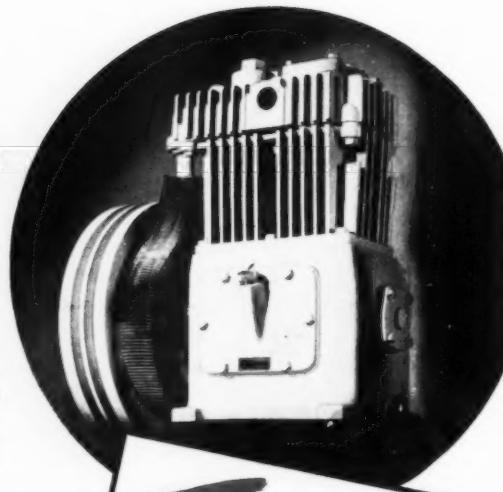
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**NEW AIR COMPRESSOR
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Accurately selects correct size and type air compressor for Diesel Starting Services in one minute. Gives free air delivery, r.p.m., piston displacement and h.p. motor required. WRITE TODAY for FREE Selector. Supply is limited!



SHEPPARD DIESEL

**COMPLETE
PACKAGED
POWER
UNITS**

SHEPPARD three cylinder, 25 hp. Diesel generator set.

The SHEPPARD, full Diesel engine of all American design and manufacture is complete with all necessary operating accessories and generator to match or power take-off—"ready to run." Bolt this power package down—fill the fuel tank and put it to work.

"Write for full particulars."

R. H. SHEPPARD COMPANY • HANOVER, PENNSYLVANIA

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One year after becoming assistant treasurer of the Westinghouse Company, Mr. Lund was also named credit manager of the Company. He is a former director of the Pittsburgh Control of the Controllers' Institute and is a director of the Credit Association of Western Pennsylvania.

Mr. Lyons joined Westinghouse in 1903 and has served as treasurer of the Company since April, 1935. During the intervening years he was continuously associated with the Company's credit department, serving as credit manager as well as assistant treasurer and assistant secretary for eighteen years. He has served as president and a director of the National Association of Credit Men.

**Robert Grant Joins Young
Radiator Company**

ROBERT GRANT has joined Young Radiator Company of Racine, Wisconsin, manufacturers of heat transfer products for the automotive, aviation, transportation, oil, power plant, industrial and heating and air conditioning fields, in a production and managerial capacity, according to an announcement by Fred M. Young, President.



EMPLOYE
prise gift o
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shortening,
for the child



Robert Grant

Mr. Grant was educated at Cornell University and is a member of the Society of Automotive Engineers, and received his early production training as a line superintendent for the Nash Motors Division of Nash-Kelvinator Corporation at Kenosha and Racine, Wisconsin. He later served as Executive Vice-President of the Fuller-Johnson Corporation, Detroit, Michigan, and its subsidiaries—Good Roads Machinery Corporation, Kennett Square, Pennsylvania and American Electric Switch Company, Minerva, Ohio. Mr. Grant leaves this position to come with Young Radiator Company.

Mr. Grant is an outstanding executive in matters of production and business control," Mr. Young stated, "and we believe his long experience in this field will be of considerable benefit to us during the immediate emergency period, and the post-war reconstruction era for which our company is already making plans."

Vellumoid Employees Send Food and Candy to English Workers



EMPLOYEES of The Vellumoid Company of Worcester, Massachusetts, are sending a surprise gift of foods and candy, packed with a war-time shipment of Vellumoid Packing, to employees of Chilcotts, Ltd., distributors of Vellumoid products in England. Soups, sugar, shortening, evaporated milk and hard candies for the children were purchased with employee

contributions in enthusiastic response to the idea conceived by Frank L. Barnes, die maker and Yankee Division veteran of the last war. The food is packed in regular Vellumoid Packing Cases, and will accompany two shipments on different transports.

These gifts were prompted by Vellumoid Employees' sympathy with the British cause, and by their realization of the hardships which workers in a company like their own were undergoing. "To most of us," explained Mr. Barnes, "Chilcotts Ltd., although we have never seen any of its people, seems like a branch of ours across the street, instead of across the sea. Working on orders for them year after year made us feel that they were our friends."

Priority Regulations Summarized

TWO important defense handbooks, one summarizing all price and priority regulations to date and the other listing every product subject to export control, have just been published by the N. Y. Journal of Commerce.

All government and voluntary price controls and priorities are brought up-to-date in the Price and Priority Digest. In addition to giving the status of nearly 200 commodities and commodity groups, prospects for civilian allot-

ments are also reviewed for quick reference on part of the purchasing executive.

The new edition of the Export Control List embraces 32 pages of product listings with all licensing and destination symbols posted next to each item. It is the fifth revision of what has become recognized as the most authentic export guide available today.

Both supplements have been published in handy tabloid form and may be had at ten cents each from The N. Y. Journal of Commerce, 63 Park Row, New York. A limited supply of O.P.M. and O.P.A. order texts, as published in the columns of the Journal of Commerce, is also available at the same price.

★ ★ ★

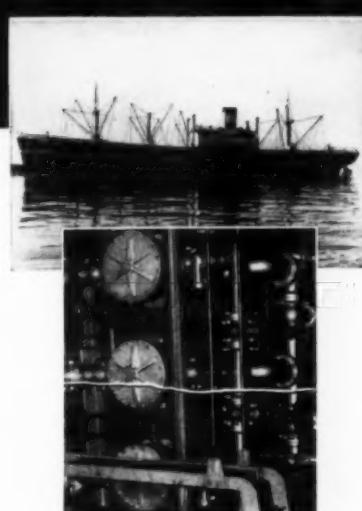
L.T. COMMANDER William K. Vanderbilt, U.S.N.R. (retired), has given his yacht "Alva" to the Navy Department as a Navy Day gift, the Department announced October 27. This yacht is reputed to be the finest afloat and has an overall length of 264 ft. 5 in., waterline length of 259 ft. 2 in., beam 46 ft. 9 in., draft 19 ft. She has a designed speed of sixteen knots and is powered with two Diesel engines, each delivering 2100 hp. Built in Kiel, Germany, in 1931, the "Alva" is said to have cost \$3,000,000.

91% OF AMERICA'S DIESEL ENGINE BUILDERS PURCHASE ROSS COOLERS

...and accordingly, ROSS heat exchangers exclusively were installed in the Diesel Motorship "Cape Alava"



Equipment list of this first completed C-1-B, newly standardized Maritime Commission design, built by Seattle-Tacoma Shipbuilding Co., includes lube oil coolers, jacket water coolers, lube oil heaters and fuel oil heaters, ALL ROSS, along with 2 Hamilton main propulsion Diesels (2160 H.P.) and 2 Washington auxiliary Diesels (525 H.P.).



(Above) Section of engine room showing 3 Ross Type "CP" Jacket Water Coolers.

DIVISION OF
AMERICAN & Standard
RADIATOR & Sanitary
CORPORATION

ROSS HEATER & MFG. COMPANY, INC.
WEST AVENUE NEAR FOREST • BUFFALO, NEW YORK

**Robert J. Howison Appointed
Automotive Sales Manager**

FRANK M. HAWLEY, Vice-President of the Morse Chain Company, announces the appointment of Robert J. Howison as Sales Manager of the Automotive Division, Morse Chain Company, Detroit.



Robert J. Howison

To his new position, Mr. Howison brings a background of more than twenty years' asso-

ciation in the silent and roller chain industry. Mr. Howison has been prominently active in the sales, sales engineering and application of timing chains for internal combustion engines, as well as general industrial silent and roller chain applications.

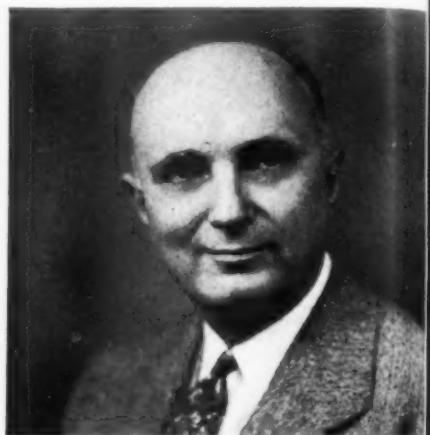
Vest-Pocket Booklet on Dippers

FOR those busy persons who want to get the most information with the fewest words, Bucyrus-Erie has published a vest pocket sized booklet on dippers which really tells the story in record time.

Entitled "Shovel Output Begins With the Dipper," the little booklet "tells all" about the importance of dippers to shovel output and delivers all the facts about Bucyrus-Erie dippers. Plenty of pictures are included, showing both construction details and performance. If the old story about a picture being worth a thousand words holds true, this booklet knocks 16,000 words off the list for those who want facts about Bucyrus-Erie dippers. Copies of "Shovel Output Begins with the Dipper" may be obtained by writing to the Publicity Department, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

**Burgy Named Eastern Engine
Sales Head by Caterpillar**

OFFICIALS of Caterpillar Tractor Co., Peoria, Illinois, have named W. C. Burgu as the company's new Engine Sales Manager for the Eastern division. Mr. Burgu is giving up his duties as district representative for Caterpillar in Ohio, Kentucky, Michigan, Indiana and West Virginia to take the new position.



W. C. Burgu

THE RIGHT WAY TO DO A VALVE JOB

Above is pictured the answer to why the HALL ECCENTRIC is the RIGHT way to do a valve job in any diesel engine.

Note that the grinding wheel does not contact the full valve seat at one time. That's because the high speed (10,000 to 12,000 R.P.M.) grinding wheel travels slowly (20 to 30 R.P.M.) around the seat with an ECCENTRIC action, making contact with only one point of the seat at a time.

THE RESULT

Grindings and abrasive particles are dispersed, not imbedded in the wheel to cause glazing or ringing, gouging or grooving of the seat; finer precision and finish are secured; seats are ground more rapidly; wheels need redressing less often and wear approx-

imately five times longer; wheel breakage is minimized; less metal is removed, leaving more of the valuable seat surface created by heat and the pounding of the valve; about one-five hundredth as much friction on the pilot.

The HALL Diesel type ECCENTRIC Seat Grinders shown here in combination with the HALL WET TYPE Valve Refacer produce a valve job that insures maximum efficiency with minimum of servicing and operating cost. Write for complete information.

THE HALL MANUFACTURING CO.
1600 WOODLAND AVENUE
TOLEDO, OHIO

research and later sales management capacity in the company's gas and Diesel engine division. He left Worthington to come with Caterpillar in 1935.

Since his experience with the first Diesel engine installed in a Navy submarine in 1912, Burgoy has spent twenty-one years in the Diesel industry and is excellently qualified for his new responsibilities due to the length and scope of his keen application to this field.

REA Loans Repayments Ahead of Schedule

TWENTY-SEVEN REA systems during September repaid on their loans more than was due. Administrator Harry Slattery announced today. These systems, in eleven States, during the month repaid \$128,845.19 in addition to their scheduled payments. Six of these systems are in Iowa; four each in Indiana, Illinois and Texas; two each in Mississippi and Georgia. The others are in Colorado, Michigan, Minnesota, Tennessee and Virginia.

By September 1, the total interest and principal which had become due under contracts covering all REA loans was \$12,156,137.48. Repayments on schedule totaled \$12,017,181.20. That left delinquencies totaling \$138,956.28.

But, to balance this total delinquency, \$3,446,669.26 had been paid ahead of schedule. This does not include the advance payments made during September. Thus, a total of \$15,463,850.46 had been repaid by September 1 as against the total of \$12,156,137.48 that was due.

Repayments, therefore, have been 127.2 percent of the total due. The arrearages of individual systems amount to only 1.1 percent of the total due.

Of the advance repayments in September, two were of \$10,000, one of them from a cooperative operating a generating plant. The smallest were four \$1,000 payments.

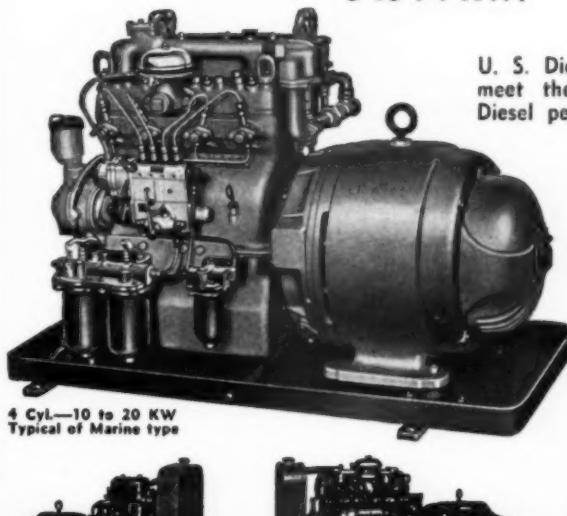
Steel Plant to Aid Navy

FOLLOWING instructions from the United States Navy Department, a \$2,000,000 expansion project at Torrance due for completion before May 1, 1942, was announced today by The National Supply Company.

On a "letter of intent" from the Navy Department, the steel company will proceed with construction of a larger plant to increase the company's forging press and lathe facilities for the

"U.S." DIESEL ELECTRIC PLANTS

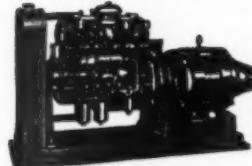
3 to 94 KW.



4 Cyl.—10 to 20 KW
Typical of Marine type



2 Cyl. 5, 7 1/2, 10 KW.



6 Cyl. 25-60 KW.



94 KW.

U. S. Diesel Electric Plants are built to meet the highest standards of modern Diesel performance. Safety . . . smooth running . . . easy starting . . . and economical operation — are the plus values which you get in a U. S. Diesel Electric Plant. One, two, four and six cylinder models. 3 to 94 KW. Complete lines for both marine and land service. Write for full information.

U. S. MOTORS CORP.

542 Nebraska St.
Oshkosh, Wis.



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SEPTEMBER
10 to 12

ADVANCED
IN ENGINEERING
AND DESIGN

HONAN-CRANE REPRESENTATIVES ARE Lubricating Engineers!

• Honan-Crane representatives have been carefully selected and trained. They have the resources and experience to advise you on any problem of contaminated oil. Remember this . . .

There is a Honan-Crane Continuous Oil Purifier to solve every dirty and contaminated oil problem for—

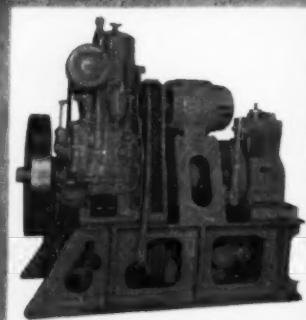
DIESEL ENGINE OIL • STEAM TURBINE OIL • INSULATING OIL
GAS ENGINE OIL • HYDRO ELECTRIC OIL • FUEL OILS
ALL KINDS OF INDUSTRIAL OILS

In these critical times you cannot afford to have equipment failures and you cannot afford to waste oil. For complete information—write Dept. P

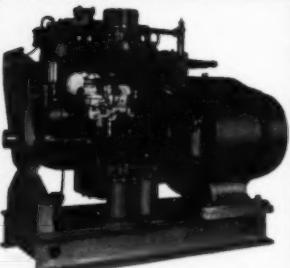


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OFFICES IN PRINCIPAL CITIES

REINER DIESEL Marine Auxiliary Units



- Marine auxiliary units 5 to 60 hp., 1 to 6 cylinder.
- With any generator — pump — compressor combination required.
- Generator sets 3 to 75 kw.
- Special auxiliary units designed to individual requirements.



JOHN REINER & CO., INC., Long Island City, N. Y.

production of shafts for large ships and other finished forgings for the Navy and Maritime Commission.

The addition will consist principally of a 1500-ton press, with the necessary complement of cranes, manipulators, furnaces and soaking pits together with five of the largest-size lathes, all to be housed in a new building 750 feet long south of the company's present forging plant. The Torrance plant was among the earliest producers of electric steel and its "Ideal Electric Steel" is shipped to oil fields all over the world.

The plant was established in Torrance in 1911 as the Union Tool Co. of which the late Dr. Jared Sidney Torrance, city founder, was president and was the first industrial plant to be located there. The company became a subsidiary of The National Supply Co., with headquarters in Toledo, Ohio, about a decade later.

Present valuation of the plant and equipment, occupying twenty-five acres on Border Ave. and Carson St., runs into several millions of dollars. Employment, now placed at around 1,000, will be increased proportionately with the new expansion.

New Order

CHARLES J. HARDY, President, American Car and Foundry Company, announces receipt of additional order from the United States Government for twelve hundred 12½ ton light combat tanks, amounting to approximately thirty-one million dollars, part of which order includes spare parts and repair parts. Three-fourths of this order will use gasoline engines; one-fourth will be Diesel-equipped. Mr. Hardy stated that a.c.f.'s total orders for these light combat tanks, including this latest one, amount to 5,885 of which 2,000 have been delivered.

Bucyrus-Erie Bulletin

FOR the man who has always cherished a yen to take a big power shovel apart to see what makes it tick, the new Bucyrus-Erie bulletin on their latest 54-B Diesel convertible shovel, dragline and crane will fill a long-felt want. The photographer they turned loose on this job must have been blessed with the insatiable curiosity of a spy on the scent of military secrets; his pictures in the new bulletin indicate that he not only climbed under, over, in, and around the 54-B, but pried the cover off of all its hidden innards as well. The result is a complete, visual answer to just about any question that could be asked about 54-B design and construction. The story of performance is told by visits to some fifteen different jobs, with pictures of the 54-B at work.

To top it off, Bucyrus-Erie engineers have tossed in several pages of facts including complete specifications and working ranges. And these are complete; in fact, you couldn't learn any more about the 54-B if you had one.

Copies of the new bulletin, designated a 54-B-4, may be obtained by writing to the Publicity Department, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

Fred R. Lowell



WOODWARD GOVERNOR CO.

WORLD'S LARGEST AND EXCLUSIVE
MANUFACTURERS OF HYDRAULIC
GOVERNORS FOR PRIME MOVERS

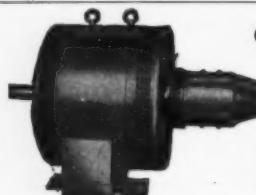
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FOR TANK GAUGING EQUIPMENT FOR
DAY TANKS & CLEAN OIL STORAGE

PETROMETER CORPORATION

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GENERATORS

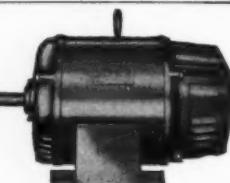
AC and DC
3 to 150 kw.

For Diesel and
gasoline en-
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MOTORS

AC and DC
1/4 to 200 hp.

For all appli-
cations Sta-
tionary and
Marine



**STAR generators and motors are extensively used in both sta-
tionary and marine service. STAR gear motors are made in
both planetary and worm gear types with and without integral
brakes.**

STAR ELECTRIC MOTOR CO. BLOOMFIELD, NEW JERSEY

THE National Supply Company announces with regret the passing of Mr. Fred R. Lowell, its Manager of Engine Sales. Mr. Lowell was a passenger on the plane of the Northwest Airlines en route to Seattle, Washington, which crashed near Fargo on October 30.

Mr. Lowell was affiliated with The National Supply organization in April, 1936, when he assumed charge of the company's Commercial Engine Sales in the Southwest with headquarters at Houston, Texas. In January, 1940, he was transferred to Springfield, Ohio, to become

Highest Quality Gaskets & Oil Seals by FITZGERALD

Gasket Craftsmen
for 35 Years

Gaskets of all types and materials to give reliable service under all Diesel operating conditions.

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SINCE 1906
THE COMPLETE LINE THAT COMPLETELY SATISFIES



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STEEL SPRINGS - CORK - RUBBER
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COMPANY
48-28 THIRTY SECOND PLACE
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SCAVENGING BLOWERS to fit Individual Engine Performance

For reliable performance and economy of operation of 2-cycle Diesel engines, much depends on the scavenging blower. That is why Roots-Connersville Rotary Positive Blowers are so widely used on important jobs.

Individually engineered or adapted from standard design, Roots-Connersville blowers help insure dependable production of low cost Diesel engine power.

ROOTS-CONNERSVILLE
BLOWER CORPORATION
112 Midland Avenue
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Manager of Oil Field Engine Sales and occupied this position at the time of his death.

Following his graduation from the University of Wisconsin in Engineering in 1926, Mr. Lowell associated with the Engineering Department of Fairbanks-Morse & Company. In 1928, he joined the Engine Sales Staff at the Chicago office and in June, 1933, became Fairbanks' representative to the Philippine Islands in charge of Sales and Service of all the company's products.

In June, 1933, he was made Manager of Export Division Machinery Department of Fairbanks-Morse with headquarters in New York. Mr. Lowell resigned this position in April, 1936, to join the National's sales staff.

Monarch Cement Company Acquires Diesel-Electric Switcher



THE Monarch Cement Company has placed this new G-E 50-ton, 300-hp. Diesel-electric switcher in service at its plant in Humboldt, Kansas. It is used for switching around the plant and replaces a steam switcher. It operates eight hours a day.

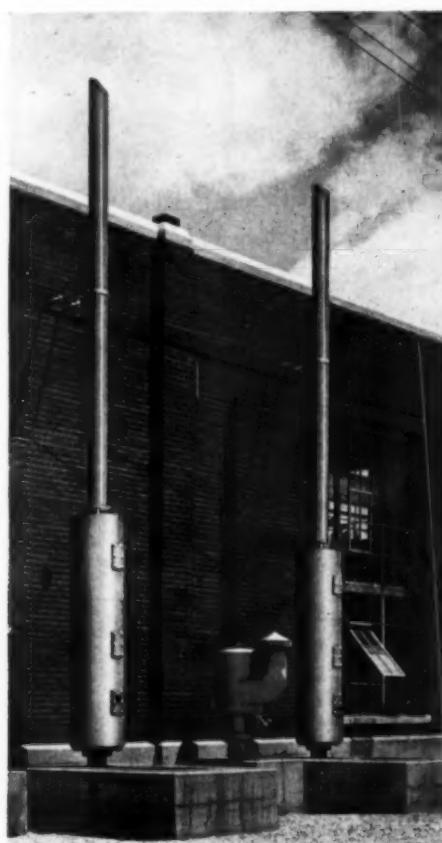
The Monarch Cement Company is also using a G-E 36-inch gage 28-ton 150-hp. Diesel-electric for hauling cars from the quarry.

New Booklet

WITH the National Defense Program making greater demands on Diesel engines, whether used for producing power and light or in transportation, Diesel operators are now faced with the problem of meeting increased maintenance on a faster, more effective basis than ever before.

Of timely interest in this connection is the newly revised, third edition of an illustrated, 20-page cleaning and de-scaling reference manual just issued by Oakite Products, Inc.

ODESSA POWER PLANT SILENCED BY MAXIMS



When the town of Odessa, Missouri, recently built a fully equipped power plant, Maxim Silencers were chosen to reduce engine exhaust noise. Installed on two 415 HP Worthington Diesels, the Maxim Silencers have proved their worth by muffling exhaust noise to a whisper without affecting engine efficiency in any way.

Write today for further information about Maxim Silencers. To meet your particular silencing problem, there are more than 550 standard sizes and models to choose from.

MAXIM SILENCERS

THE MAXIM SILENCER COMPANY
98 Homestead Ave., Hartford, Conn.

Please send details on your exhaust intake silencers for diesel engines.

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Company _____

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ONLY BUCKEYE DIESELS



GIVE YOU ALL THESE FEATURES

1. Silent Watchman (Patented).
2. Full pressure lubrication system.
3. Sleeve cylinders.
4. Exhaust and intake manifolds not bolted to cylinder head.
5. Reversible shell type silver alloy bearings.
6. Individual pump for each cylinder.
7. Completely enclosed.

They insure long life, high efficiency, low maintenance—all meaning lower power costs. Write for catalogs on your letter-head.

The Buckeye Machine Co.
Lima, Ohio
Engine Builders Since 1908

New York, N. Y., containing many time-saving tips and short cuts on the maintenance of Diesel engines and required accessory equipment.

Concise describing safe, modern methods for descaling Diesel engine cooling systems to prevent overheating and other operating troubles, the booklet gives detailed data on Oakite Compound No. 32, a material specially designed to provide a combination of high scale and rust removing properties with a safety factor to both equipment and personnel far beyond that possible with commercial raw acids. Its wide range of activity is also said to help eliminate the need of resorting to time-consuming mechanical methods for de-scaling such other equipment as ammonia compressors and condensers, and water-cooled air and gas compressors.

In addition, the booklet contains considerable information on such related maintenance work as removing rust, scale, oil and muck from "lube" oil coolers, jacket-water coolers and other heat exchange equipment.

Free copies are available upon request to Oakite Products, Inc., 22D Thames Street, New York City.

★ ★ ★

AN Enterprise 100 hp. Diesel has been installed in the 58-foot trawler *Sunrise*, built by the Marine View Boat Building Co., Tacoma, Washington, for Captain Jack Benson of Seattle.

The Bush-Bailey Diesel School Expands

THIS school was organized by Mr. R. S. Bush, a man with many years of Diesel experience, in 1936. Mr. C. W. Bailey became associated with the school in July of 1941, assuming the duties of president. Since that time the school has been making phenomenal

Thompson Valves FOR DIESEL ENGINES

Ferchrome L Alloy Steel Valves Cut Overhaul Costs! Valves and Seats Available in All Types for Large Engines.
SEND FOR DETAILS!

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COLUMBIA A. C. GENERATORS

• Columbia A. C. Generators are quality built and attractively priced for resale by engine builders and dealers.

Sizes: 1 to 300 KVA
Speeds 1800, 1200, 900, 720, 600, 514, 450 R.P.M.
Single or 3 Phase

Furnished with either direct connected or belted exciter. Prompt shipment.

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A. C. Generator with
Direct Connected Exciter

METERING WILL STOP LOSSES, CUT COSTS, IMPROVE EFFICIENCY IN YOUR PLANT



Pittsburgh Piston Meter
for Measuring Oil Used
by Diesel Engines.

There is only one accurate way to measure the oil consumed by Diesel engines—by meter.

Diesel power requires accurate meter records to prove its economy.

In addition, the careful daily analysis of meter readings will show up power loss at its inception and guard against overloads.

Write for literature.

PITTSBURGH EQUITABLE METER CO.
PITTSBURGH, PENNA.

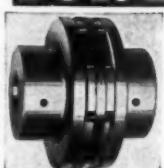


Deliver more oil when engine speeds up, less when it slows down, and none at all when it stops.
Sight glasses on Model 94 show actual amount of oil being delivered at lubrication points.
Once feed is set, Manzels require no attention except to keep oil reservoir filled.
Provide dependable lubrication on thousands of Diesel engines.

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MANZEL BROTHERS CO.
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a Better Flexible Coupling FOR DIESELS



L-R TYPE "W"

For Use on Engines with
Stub Shafts or Power Take-
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Complete range of sizes. All
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minimum maintenance. Used
by many engine operators.
Recommended by manufacturers.

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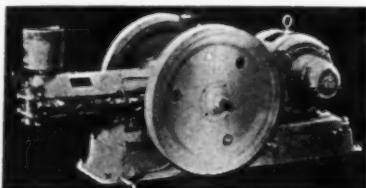
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YOUR
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POWER
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COSTS

Step down your power and light costs. Step up your operating profits. Get a performance - proved WITTE Dielectric Plant. Take advantage of the extra quality construction and superior engineering that can save you money every day you operate. Produce electricity for ONE CENT a Kilowatt.

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LARGEST BUILDER OF SMALL DIESELS

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EQUIPMENT**
for installation by
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PICKERING GOVERNOR CO.
PORTLAND, CONN.

D.G. DIESEL GASKETS
ORIGINATORS OF
the famous
TWIN TYPE
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DETROIT GASKET & MFG. COMPANY • DETROIT

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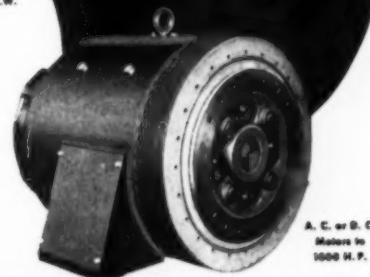
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Users and builders of smaller Diesel Engines find Burke Direct or Belt Drive Generators the answer to auxiliary and stand-by units for emergency lighting or power. Write Burke for recommendations. You profit by Burke's 50 years' experience.

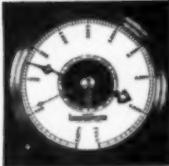
A. C. or D. C.
Generators to
1000 K.W.



A. C. or D. C.
Motors to
1000 H.P.

BURKE ELECTRIC CO Erie, Pa.

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YOUR FUEL
SUPPLY
AT A
GLANCE**



Write for Bulletin

THE LIQUIDOMETER CORP.

36-24 Skillman Ave., Long Island City, N.Y.

**Lower Your Cost of
Filter Maintenance with
Re-Packable Element Type**

MICHIANA FILTERS

MICHIANA PRODUCTS CORP., Michigan City, Indiana

**YM LUBE OIL PURIFIERS
REMOVE FUEL DILUTION
ACIDS . . . SLUDGES . . .**

Clean Oil . . . Clean Engines

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Gray Marine Diesels
Based on the Engine developed
and built by General Motors,
adapted and equipped for marine
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1 to 6 cylinders, 25-165 H.P.
Both Rotations
Reduction Ratios to 4.4:1
Fresh water cooling standard
GRAY MARINE MOTOR COMPANY
490 Canton Ave. Detroit, Mich.

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Class S.F.
LUBRICATORS

A modern lubricator for modern service on Diesel, gas, steam engines and compressors. Supplies dependable cylinder lubrication in metered quantities reducing friction and wear. Capacities: 2 to 24 pt. and 1 to 16 feeds. New catalog on request.

RESULT OF 40 YEARS' LUBRICATOR BUILDING EXPERIENCE

McCord RADIATOR & MFG. CO. DETROIT, MICHIGAN LUBRICATOR DIVISION

progress and has been forced to expand twice in order to accommodate the students. The Bush-Bailey Diesel School gives both a thorough training in the fundamentals of Diesel and practical shop experience. As the Diesel industry is still in its infancy, the Bush-Bailey Diesel School is very optimistic about the future.

Jim Lalley, New Assistant Manager of the Seattle-Tacoma Shipbuilding Company at Plant #1, Tacoma



MR. LALLY is very largely responsible for the successful completion of the five C-1-B Maritime Commission Motorships, detailed story on which appears in this issue.

★ ★ ★

THE Navy Department has awarded a contract to the R. T. C. Shipbuilding Corporation, Camden, N. J., for the construction of two Diesel-propelled coastal tankers to be 220 ft. in length, 37 ft. beam, and 14 ft. deep, with 1830 deadweight tons each.

**CRACKED HEADS WELDED
• ENGINES REPAIRED
Satisfaction
Guaranteed
VALVE SEATS
HARD SURFACED**

BRODIE
AN ENGINEERING SERVICE

117 Clinton Pl.
Brooklyn,
New York

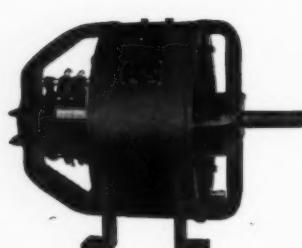
COLUMBIA D. C. GENERATORS

These Columbia generators are designed for light and power service and are ideal units for use as ship auxiliaries. They are light in weight, compact and can be furnished in single bearing type for direct connection to engines. Prompt shipment can be made.

SIZES: 3 to 125 KW

SPEEDS: 1750, 1450, 1150, 850 R.P.M.
36, 60, 125, 250 Volts

COLUMBIA ELECTRIC MFG. CO.
4519 Hamilton Ave., Cleveland, Ohio



LUBRICATION • LIQUID TRANSFER



COOLANT • HYDRAULIC • FUEL OIL
"CAN'T BEAT
TUTHILL SMALL PUMPS
FOR INDUSTRIAL SERVICE"

Whether you are considering a design which includes coolant, hydraulic operation, lubrication or liquid transfer, it will pay you to get the facts about Tuthill precision-built pumps. They are engineered for the job and can be furnished in various capacities from 1 to 200 gallons per minute at pressures up to 350 psi.

If the drive shaft reverses, Tuthill's automatic reversing pump provides the answer because it delivers from the same port regardless of shaft rotation.

Automatic pressure releasing feature is included in the Tuthill Model M coolant pumps. This permits the escape of chips or foreign matter without injury to working parts, and also compensates for wear.

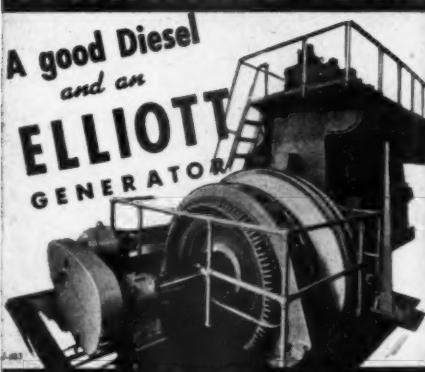
Tuthill provides stripped model pumps for direct incorporation into the design of any machine. All Tuthill pumps have a reputation for uniform quality, dependability, and long life performance, backed by hundreds of thousands in use today.

GENERAL CATALOG AVAILABLE ON REQUEST

TUTHILL PUMPS

TUTHILL PUMP CO. 935 E. 10th St. Chicago, Ill.

A WINNING TEAM



ELLIOTT COMPANY
Electric Power Dept., RIDGWAY, PA.

EXPERIENCED DIESEL OPERATOR AND MECHANIC AVAILABLE

If you need a man thoroughly familiar with the fundamentals of Diesel, plus a wide range of experience in operating, repairing and servicing many different types of Diesel engines, contact

BUSH-BAILEY DIESEL SCHOOL

4106-08-10 N. Broadway

St. Louis

Missouri

THE PURE OIL COMPANY

CHICAGO, U.S.A.
A COMPLETE LINE OF INDUSTRIAL PETROLEUM PRODUCTS
A Pure Oil engineer will help solve your lubrication problems. Write today.



Be sure with Pure

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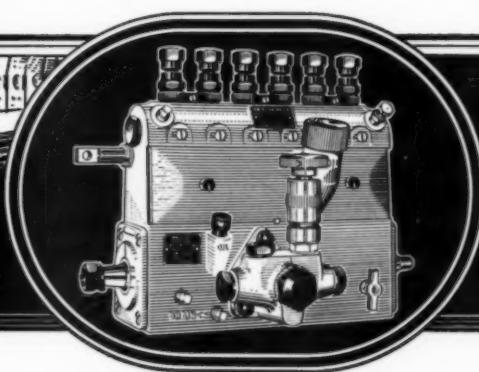


WHY do the majority of Diesel engine manufacturers depend on American Bosch Fuel Injection Equipment?

Uniform high quality . . . large production capacity . . . a wide range of types and sizes . . . extensive research facilities . . . the greatest of experience . . . outstanding performance in the field . . . a widespread service organization.

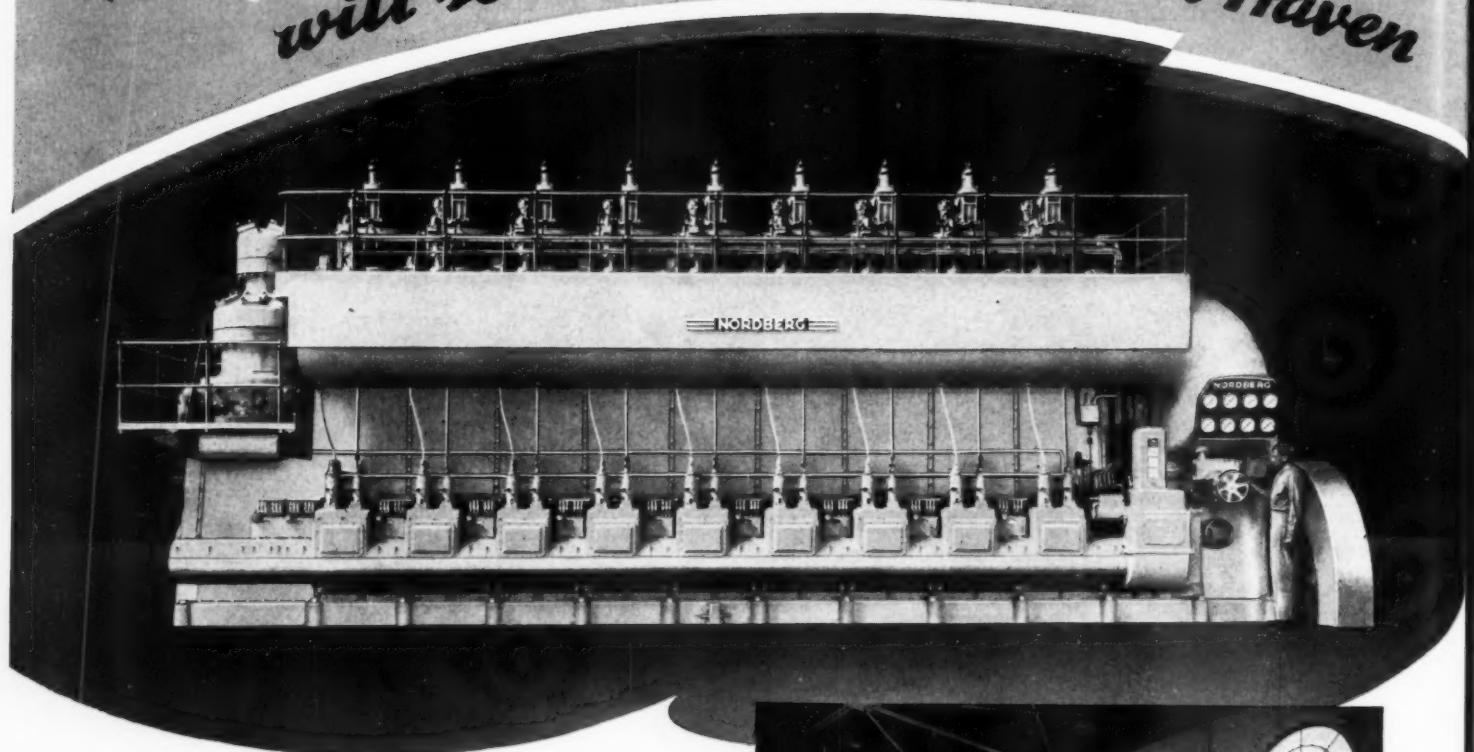
These are the principal reasons for the choice of American Bosch. But another factor is our genuine interest in the problems of the manufacturers of Diesel-powered equipment—problems which we willingly shoulder in recognition of our responsibility to the Diesel industry . . . just as we have established a Fuel Injection Equipment School open to anyone connected with the construction, maintenance or operation of Diesel engines.

AMERICAN BOSCH CORPORATION
SPRINGFIELD, MASSACHUSETTS

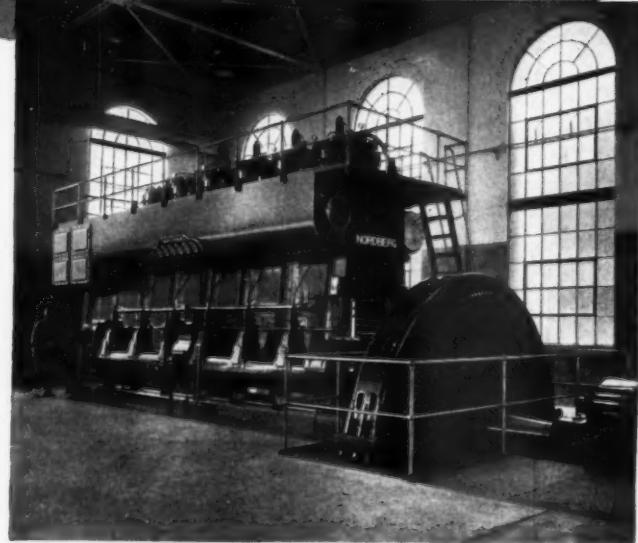


AMERICAN BOSCH
Fuel Injection  *Equipment*

*Another NORDBERG DIESEL
will serve the City of Grand Haven*



The City of Grand Haven, Michigan, has bought its second Nordberg Diesel, a nine-cylinder unit of 3850 horsepower. A six cylinder Nordberg Engine of 2250 horsepower was placed in service in 1937 . . . This is another of the many satisfied users who continue to place repeat orders for Nordberg Diesels because of the excellent performance of the original installation. The large proportion of repeats among Nordberg Diesels is evidence that these engines meet the users' expectations of reliability and economy of operation. Simple design, easy to maintain and the efficient burning of low grade, inexpensive fuels are features to remember when considering the purchase of a Diesel Engine. When you require additional power, join the many satisfied users and install Nordberg Diesel power.



Above is the new nine-cylinder unit of the air injection type, while below is the original six cylinder installation. Both are of the two cycle type constructed with crossheads.



NORDBERG MFG. CO., MILWAUKEE

NEW YORK WASHINGTON CLEVELAND KANSAS CITY DALLAS LOS ANGELES



Repre
in all
the Un
Canad

Victory for Diesel Operators over

- ★ BLOW-BY
- ★ COMPRESSION AND POWER LOSS
- ★ RING AND CYLINDER WEAR
- ★ EXCESSIVE OIL CONSUMPTION
- ★ FREQUENT OVERHAULS

Today's pressing need for uninterrupted stationary and marine power leaves no time to risk shut-downs, long overhauls or wasted fuel. Diesel operators of long experience use and recommend Double Seal Rings as the surest preventative and cure for costly engine ailments.

Your order, large or small, for Double Seal Piston Rings will receive our usual prompt careful attention. We work day and night to serve you more rapidly



**DOUBLE SEAL
RING COMPANY**

MAIN OFFICE & PLANT: FORT WORTH, TEXAS
BRANCH OFFICE & PLANT: 157 CHAMBERS ST., NEW YORK

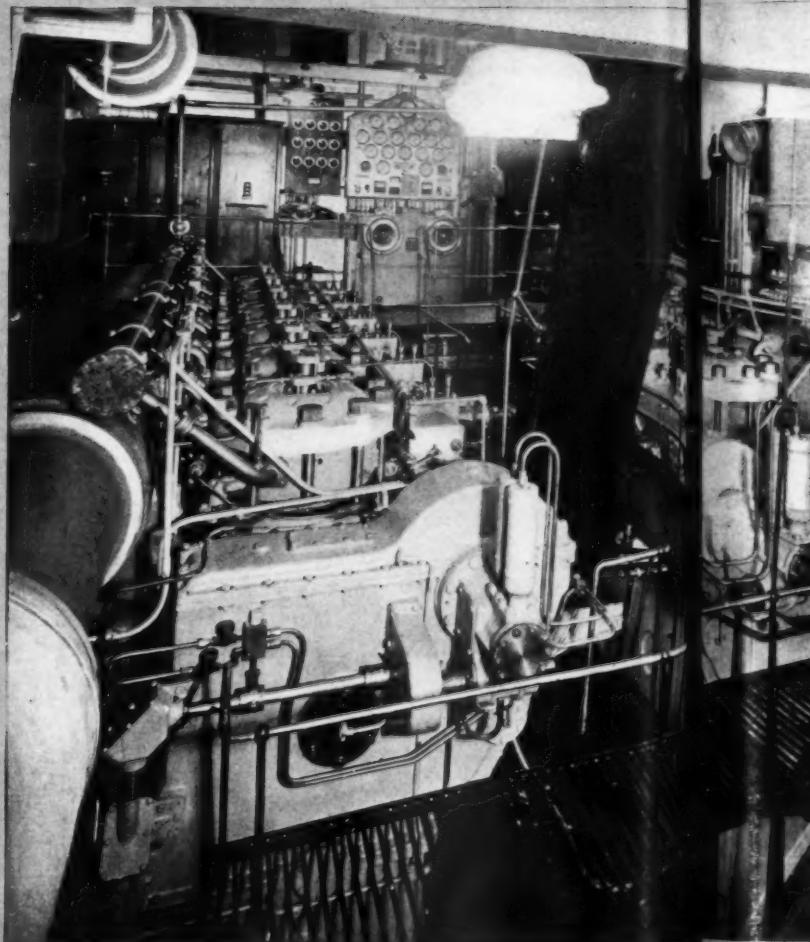
Representatives
in all Key Cities of
the United States,
Canada & Mexico

HAMILTON DIESELS in 11

Five well-designed, well-built, well-powered, economic, efficient Diesel Ships—CAPE FAIRWEATHER, CAPE ALAVA, CAPE FLATTERY, OREGON, IDAHO—are now usefully serving the purpose for which they were created. Congratulations are extended to the Maritime Commission and to the Seattle-Tacoma Shipbuilding Corporation on the successful completion of this eleven million dollar contract.

All five ships are of the C-1-B type of cargo carriers. They are all 416' in length, 60' beam, and 27'6" draft, rated at 8,975 D.W.T. The main power plant in each ship consists of two HAMILTON DIESELS, six cylinder, two cycle, single acting, 21½" x 27½", rated at 2160 hp., and operating at 233 rpm. Each pair of HAMILTON DIESELS drive through Westinghouse reduction gears and Westinghouse electric couplings to one propeller shaft.

HAMILTON DIESELS have been going to sea in U. S. submarines and cargo ships for many years. The first Hamilton Diesel-equipped cargo ship was the "Seminole", built in 1926, followed by the "New Orleans" and the "Wichita" in 1927—all still in active service. Now Hamilton Diesels are doing an equally satisfactory job in these five big, new cargo carriers. In our recently enlarged Diesel Shops, we are devoting ALL of our Diesel engine building resources to Defense Activities.



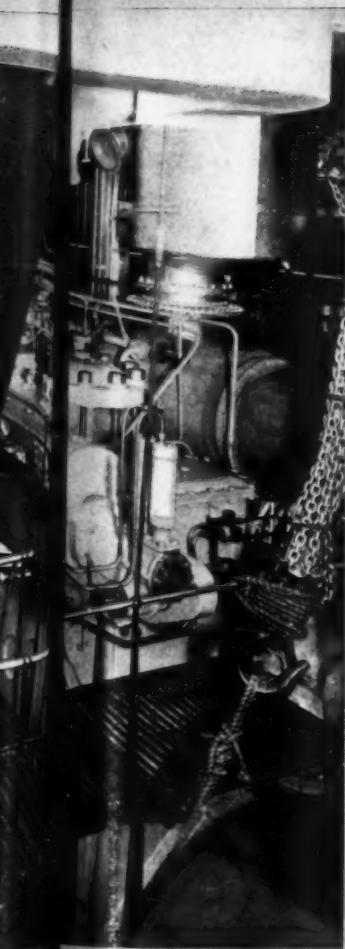
Engine room
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completed by
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GENERAL MACHINERY CORPORATION

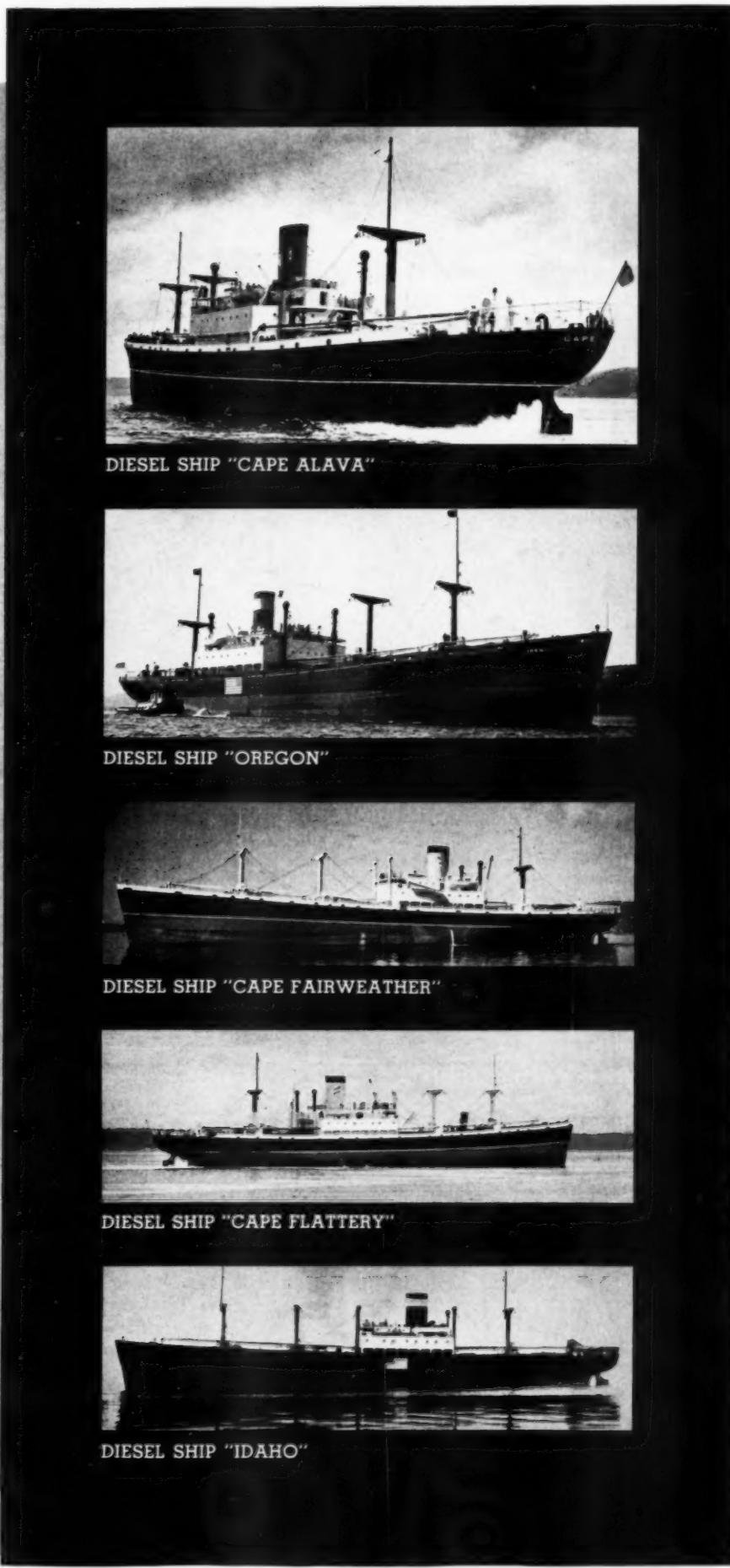
Hooven, Owens, Rentschler Division . . . Hamilton, Ohio

HAMILTON DIESEL ENGINES

in 11 five ships

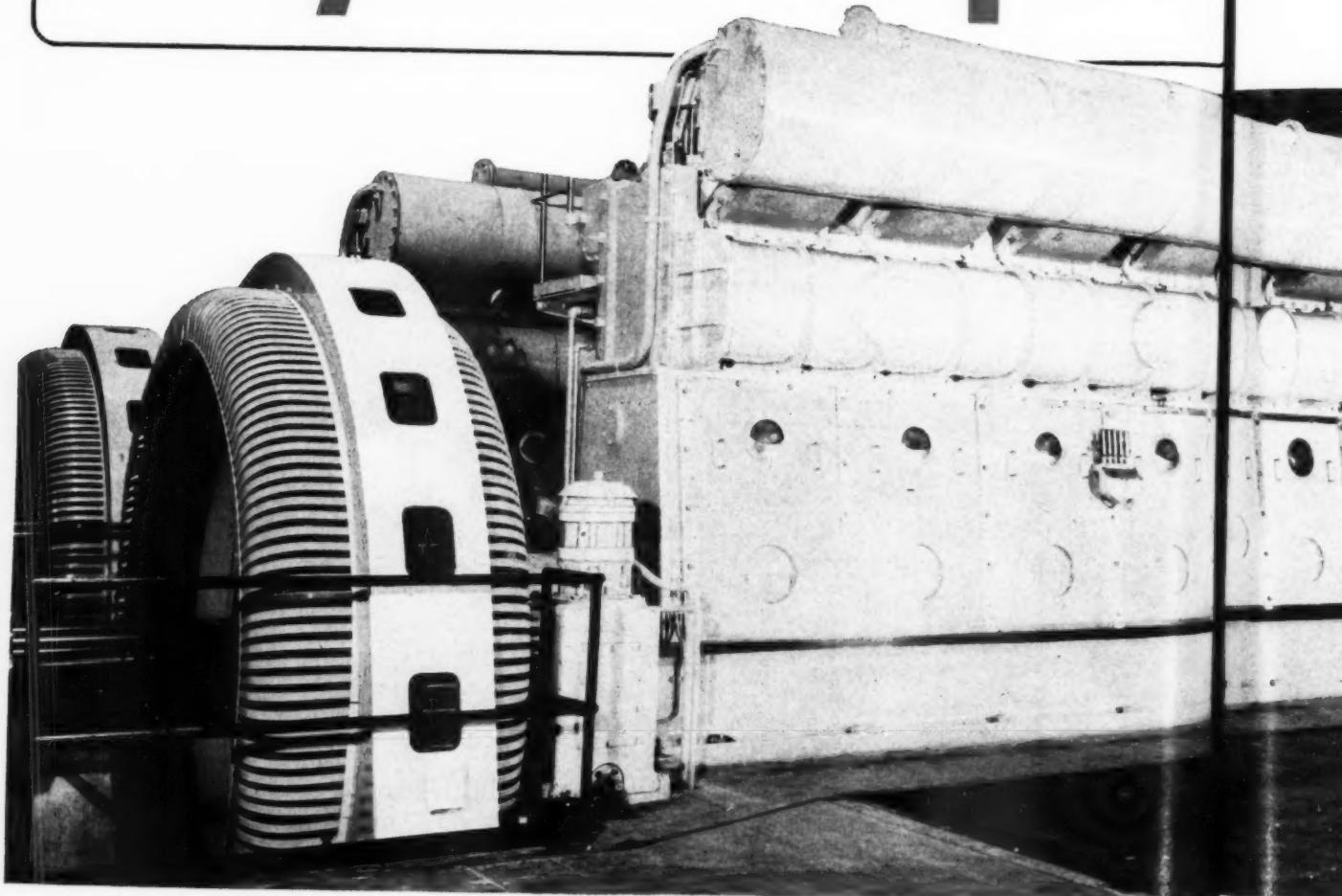


Engine room layout on the five Maritime Commission cargo carriers recently completed by the Seattle-Tacoma Shipbuilding Corporation.



WITH GARGOYLE D.T.E.'S IN YOUR DIESELS—

Oil Passages Stay Wide Open



**CALL
IN Socony-Vacuum for "Co**

YOU'LL BENEFIT FROM: 75 YEARS' LUBRICATION EXPERIENCE •
PRODUCTS APPROVED BY ENGINE BUILDERS •

WHEN
that's
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D.T.E.
bearing
Delvac
small,

Co

THE RIGHT
LUBRICANTS

WHEN OIL PASSAGES get clogged, burned-out bearings may result. And that's the kind of trouble Gargoyle D.T.E. Oils can help prevent.

The high stability of these oils provides maximum resistance to oxidation in the presence of heat, water and other impurities.

D.T.E. Oils resist the formation of deposits in oil passages . . . help assure bearings of adequate lubrication.

Delvac 500 Series Oils give the same clean, economical performance in small, high-speed Diesels.



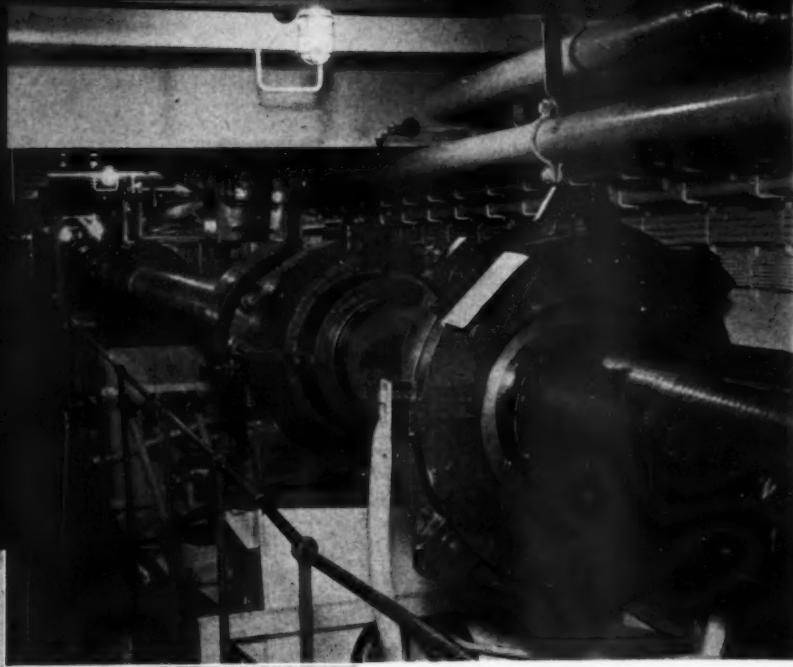
"Correct Lubrication"

THE RIGHT OIL FOR EACH JOB • NEW LUBRICANTS AHEAD OF NEW NEEDS •

SOCONY-VACUUM OIL COMPANY, INC. • Standard Oil of New York Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadham Div. • Southeastern Div. (Baltimore) • Magnolia Petroleum Co. • General Petroleum Corp. of Calif.

ERIE

Proved by innumerable installations, dependability and long life are two qualities guaranteed in Erie forgings. For this reason, leading engine and ship builders use Erie equipment consistently.



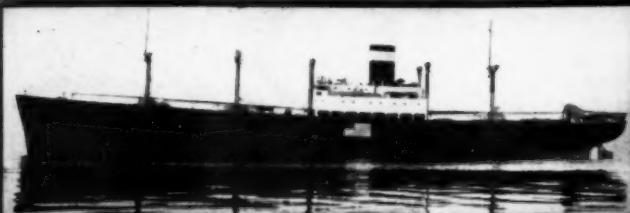
The shaft alley on the Diesel ship "Idaho". Erie Forge Company supplied the five-section propeller shafting and also the crankshafts for the two main Hamilton Diesel engines on this ship and her four sister ships recently completed by the Seattle-Tacoma Shipbuilding Corp.



ERIE FORGE COMPANY, ERIE, PENNSYLVANIA

Engine room
all five ships:
ton, 6-cylinder

SELECTED BY THE LEADERS



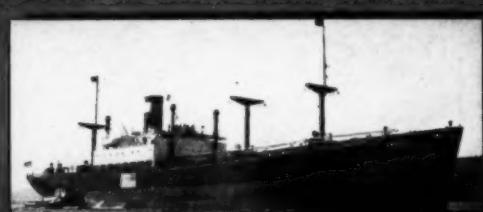
DIESEL SHIP "IDAHO"



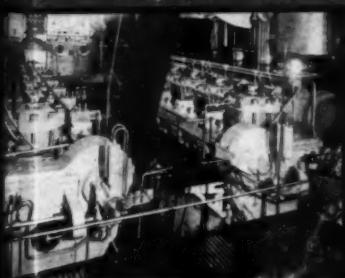
DIESEL SHIP "CAPE FLATTERY"



DIESEL SHIP "CAPE FAIRWEATHER"



DIESEL SHIP "OREGON"



DIESEL SHIP "CAPE ALAVA"

Engine room arrangement is identical in all five ships: Main engines are two Hamilton, 6-cylinder Diesels rated 2160 hp. each at 233 r.p.m.

AMERICAN BEARING CORPORATION

AFFILIATED WITH NATIONAL LEAD COMPANY

INDIANAPOLIS



INDIANA

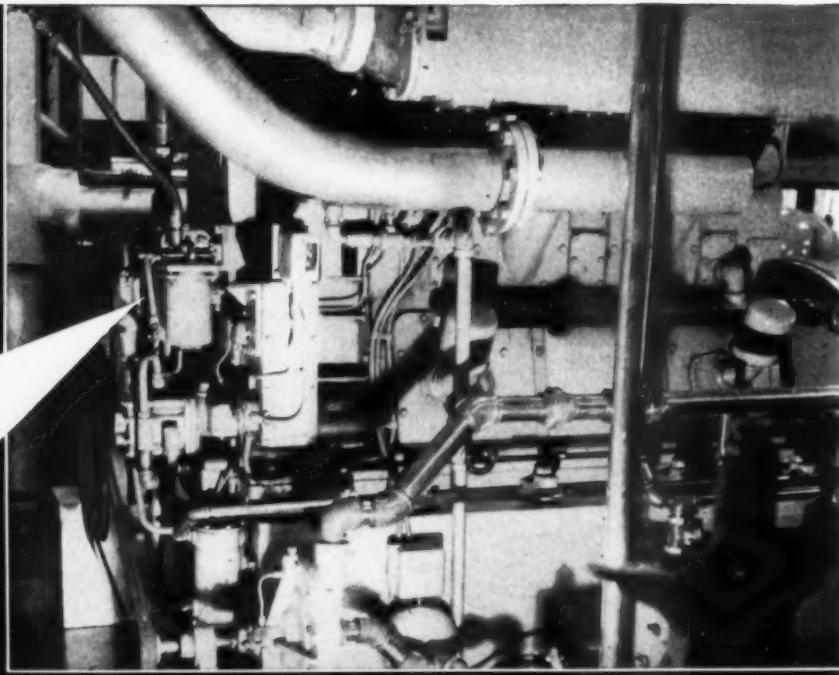
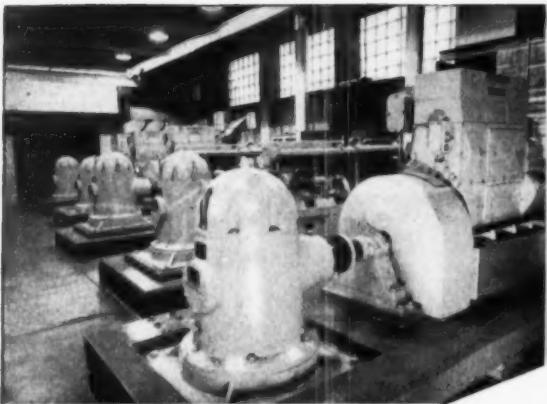


SATCO*

metal as used in bearings, manufactured by American Bearing Corporation, is widely known and accepted among leading Diesel engine designers and operators because of its unique characteristics. This bearing metal was developed especially to meet the needs of the modern Diesel engine. It has strength without brittleness. It has resistance to compression yet possesses sufficient plasticity to conform to the shaft which results in uniform distribution of loads over the bearing area. These features render Satco* the ideal Diesel engine bearing metal.

Again, a leading Diesel engine builder—General Machinery Corporation—demonstrated its confidence in Satco* dependability and durability by equipping the 2160 hp. Hamilton Diesels, propelling these five great ships, with Satco* bearings. We are proud to fulfill such a vital requirement in these important C-I-B cargo vessels recently completed by the Seattle-Tacoma Shipbuilding Corporation, under the U. S. Maritime Commission program.

*A patented alloy manufactured by National Lead Company. Trade mark registered.



At Springfield's
new Pumping
Station,
too *KEEP IT CLEAN*

with
PUROLATOR

is vital in dependable
Diesel performance

With a complete line of filters for both lubricating and fuel oils, Purolator saves money and worry for thousands of Diesel operators. Constant development work assures the adaptability of the Purolator line to both old and new engine designs, on both land and sea.

TWO PUROLATOR TYPES WIDELY USED IN MODERN DIESEL PLANTS



One result of Purolator's constant development work is the N-2909 Purolator—a replaceable element lubricating oil filter for engines on continuous heavy-duty work. The N-2909 Purolator is recommended for Diesel engines from 35 to 50 h.p., for gasoline or gas engines from 40 to 100 h.p., where used in continuous, severe service. Purolators of greater capacity are available for bigger engines.



For the fuel line, DN-Type Purolators, mounted on the pressure side of the fuel transfer pump just ahead of the injection pump, remove the extremely fine foreign particles that would seriously damage the injection system. When the filtering element becomes saturated, it shuts off all flow. No dirty fuel is ever allowed to pass.

A city the size of Springfield, Mass., simply can't take chances with failure of sewage disposal. So, in the new sewage system recently completed, Springfield turned to Diesel power to keep the pumps going. And to keep the Diesels going without interruption—they turned to Purolator oil filters!

Result: no breakdowns, no repairs of any kind during the first year of operation. The plant is doing a hard, continuous job—efficiently and economically.

CLEAN OIL—free from dirt and abrasives—is assured by Purolator-protection. Lube oil Purolators protect the lubrication system. Fuel oil Purolators guard against the abrasive action that would otherwise result in costly damage to the fuel injection system. When you think of filtration, think of the founder and leader of the oil filter industry—Purolator Products, Inc., Newark, N. J.

Have you a piston ring problem?

LET US LEND YOU
A HELPING HAND!



SEALED POWER PISTON RINGS

IT happens in the best installations, these piston ring problems. They crop up here, there and everywhere—sometimes for no apparent reason. Some are bafflers—even to our engineers—yet somewhere there is a solution. Perhaps right now you are perplexed with some piston ring problem. Perhaps a different ring or combination of rings will remedy the situation. Whatever it is, our engineers would like to help you solve it. Let us lend you a helping hand.

SEALED POWER CORPORATION
Muskegon, Michigan
In Canada, Windsor, Ontario

NO.

9

ALUMINUM, DEFENSE, AND YOU



SIX MORE PLANTS IN FIVE STATES ON THE WAY

DEFENSE PLANT CORPORATION OWNS THEM. We've been designated to build them . . . fast.



Actually, when the names went on the dotted lines of the contract on August 19, we had already placed more than \$16,000,000 worth of orders for some of the equipment and materials it takes longest to make and get.



FIVE OF THESE PLANTS will smelt aluminum. Their combined capacity is planned for more than 500,000,000 pounds a year, which is greater than the nation's entire production of aluminum in 1940. Locations: Massena, N. Y., Spokane, Wash., Troutdale, Ore., Los Angeles, and in the State of Arkansas.



The sixth plant will refine alumina from bauxite. Its billion-pounds-a-year capacity adds 58% to the nation's alumina capacity. It will be located at Bauxite, Arkansas.



HOW GOES CONSTRUCTION? At this writing, as fast as title is secured to the sites, contracts are being let for grading and foundations so as to be ready for the structural steel, which is coming as rapidly as it can be gotten. What is more important, the aluminum plants are scheduled to deliver ingot by the summer of 1942; the refining plant to deliver alumina in early summer, 1942.



WE'VE ASSIGNED a large staff of men full time to headquarters engineering, purchasing, and accounting on this government building job.

We're sending competent and experienced management men out on these jobs as superintendents and other staff executives on construction, and for subsequent operation of such of these plants as we are designated to operate.

EVERY KNOWN IMPROVEMENT in design and construction and equipment is being incorporated in these plants. We intend that every dollar that will be spent shall be the best dollar's worth that experience can build. We do not make one cent of profit from this assigned job of construction.

We think we know how to get the government value-received for its money, because we are completing the expenditure of more than \$200,000,000 of our own money in an expansion program which started after the beginning of the present war. Some of this expenditure is in new alumina and aluminum plants which will bring our own Alcoa capacity up to more than 700,000,000 pounds a year. The remainder is in tremendous expansion of facilities for fabricating every form of aluminum.

DEFENSE, GENTLEMEN, is getting its aluminum.

ALUMINUM COMPANY OF AMERICA

DEPENDABLE POWER

De La Vergne Diesel Engines



● Today's production requirements demand uninterrupted power supply. World conditions make it imperative that every possible safeguard be taken to prevent power failure.

Your best insurance for an uninterrupted power supply is a De La Vergne Diesel Engine. Known throughout the

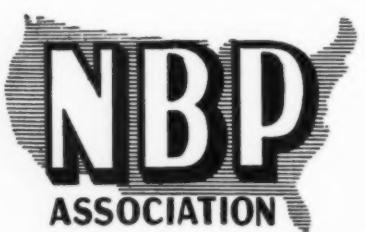
country for their dependable and economical operation, De La Vergne Diesels are available in sizes from 200 bhp to 1,500 bhp. Let De La Vergne engineers investigate your power problem.

Baldwin De La Vergne Sales Corporation, Philadelphia, Subsidiary of The Baldwin Locomotive Works.

Baldwin De La Vergne
SALES CORP.

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA





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Because membership in the National Business Papers Association means the raising of standards of business paper publishing—and *we believe in that*.

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Hundreds of fighting craft of the type illustrated use Hussman Vibration Controls to isolate vibration. They eliminate the transmission of vibration to the ship's hull, deck and superstructure, protecting operating machinery, radios and compasses, and isolate disturbing noises that would otherwise annoy officers and crew.

Vibration Control is Simple!

Ever ride in a car without springs? Would be rough going, wouldn't it? Every bump and hole would set up vibrations that would be transmitted through the entire body.

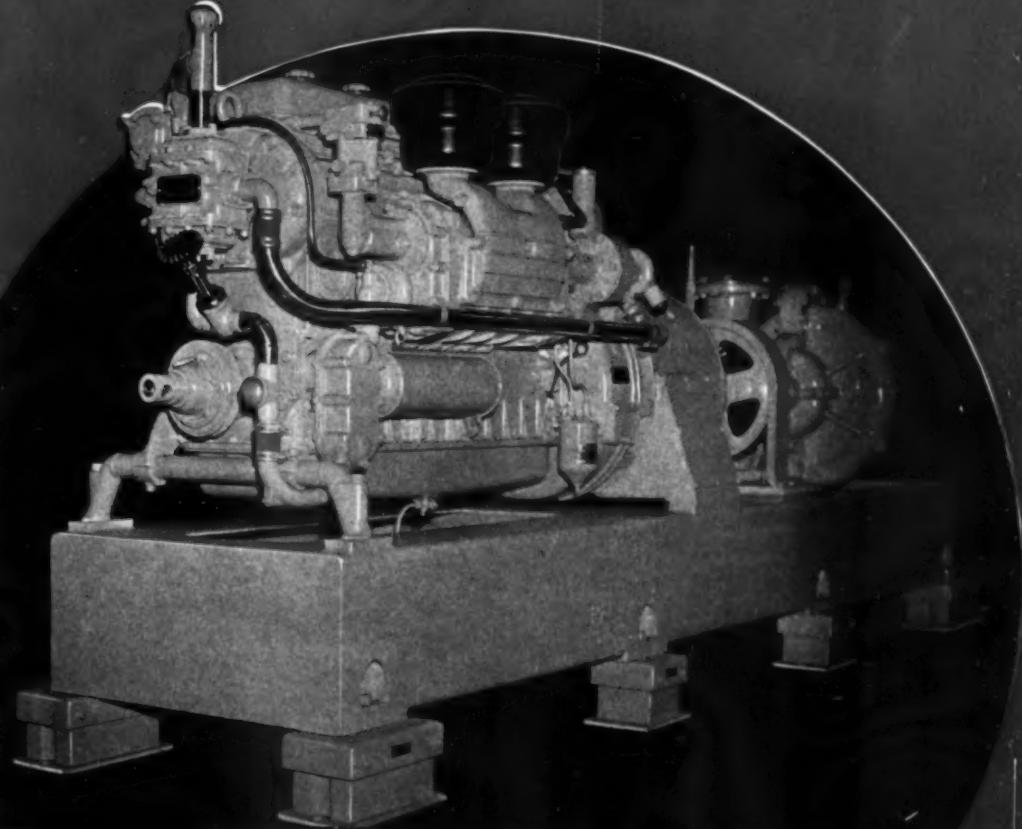
Same thing with Diesels—unbalance, thrust and internal explosion set up vibrations that are transmitted through the base, into deck, hull and superstructure.

Hussman Vibration Controls positively and effectively solve this problem which has so long been a source of annoyance, destructiveness and in some cases high maintenance costs.

Hussman Vibration Controls, involving a single proven principle, are available in specially designed sizes and types for application to every Diesel installation. No cork, felt, rubber or other organic materials are used. Get the complete facts!

CARL HUSSMAN Engineers
3003 North Oakley Blvd., Chicago, Ill.

The modern 110 ft. U. S. Coast Guard Cutters are protected against destructive vibration by Hussman Spring Mountings under the General Motors 6 cyl. auxiliary sets (connected to Warren Fire Pump and Westinghouse Generators in tandem). Similar units are used on the 600 H.P., 700 R.P.M. 2-cycle "V" type 8 cyl. General Motors diesel power plants.



H U S S M A N
VIBRATION-AND NOISE CONTROL EQUIPMENT

Silent Night!?

THUMP THUMP THUMP

IS 24 HR. OPERATION OF COMPRESSORS, DIESELS, ETC., CAUSING COMPLAINTS ? ? ? ? ?

Are people near your plant complaining of noise at night? If so, and the noise is from the air intake on compressors and internal combustion engines, here's the solution:

PROTECTOMOTOR SILENCER-FILTER FOR ENGINE INTAKE

The Model DS Silencer-filter hushes the most raucous air intake—plus preventing the entry of abrasive foreign matter. Your Model DS does double duty—helps prevent complaints due to night operation, saves excess wear on engines and compressors due to intake

Always Reduces Engine Wear — May Prevent a "Nuisance Action"

Model DS Construction Features

A. Series of cylindrical rectifying chambers of scientific diameter to length ratio which smooths out sound waves.

B. Dry Feltex Filtering Medium 99.8% efficient by University of California Laboratory tests.

C. Radial Fin Construction. Permits large area of filtering medium to occupy smallest possible space.

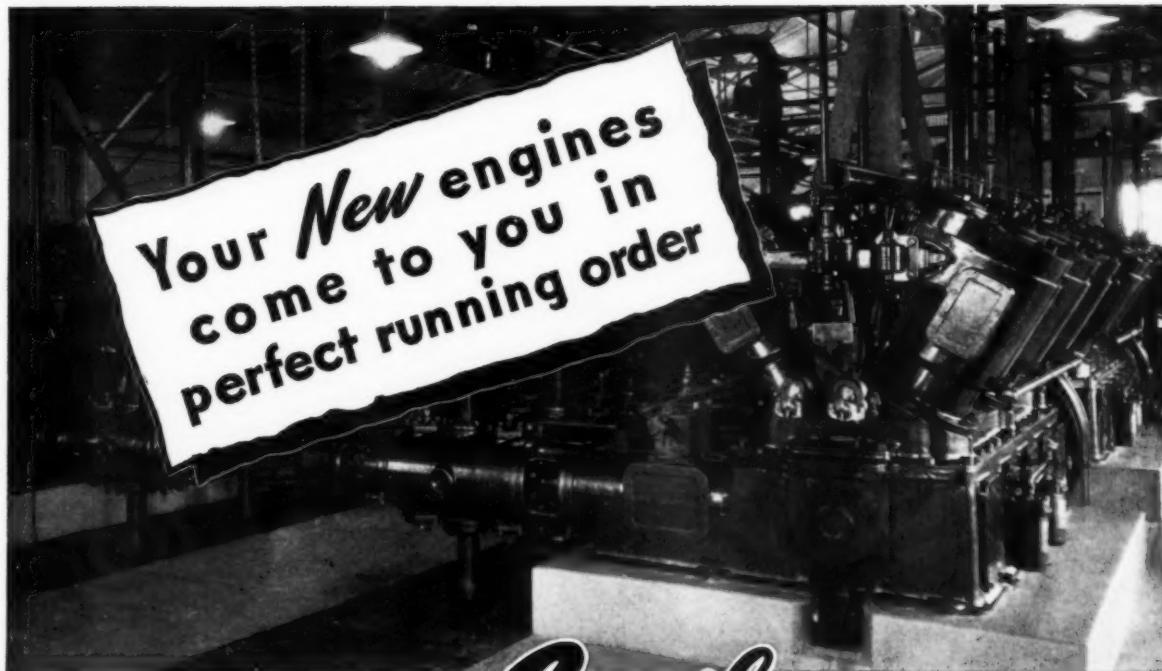
D. Rigid, galvanized mesh frame.

E. Reinforcing tube. The model DS Protectomotor is "built like a battleship."

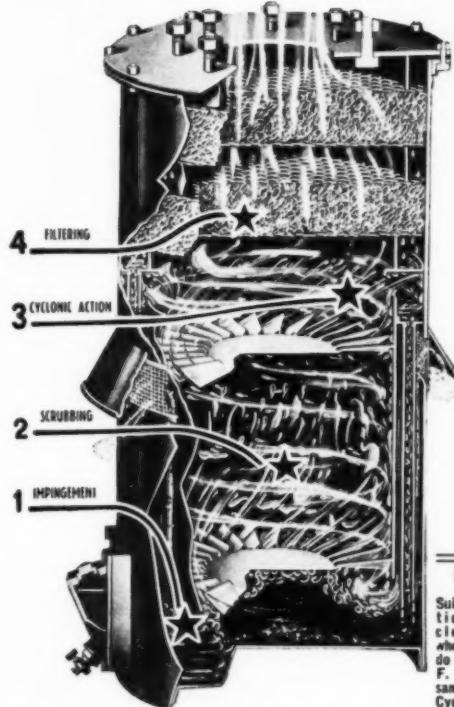
STAYNEW FILTER CORP.
12 LEIGHTON AVE., ROCHESTER, N. Y.
"Air Filter Headquarters"

PROTECTOMOTOR
99.8% Efficient
AIR FILTERS

NEW CATALOG
44 pages, completely
illustrates filters for
ventilation and pipe lines
as well as engine intake.



Cycoil CLEANERS WILL KEEP THEM RUNNING PERFECTLY LONGER!



Write for Cycoil Bulletin No. 130D which gives complete information on the operation of the Cycoil.

Today—more demands are put on engines than ever before—they *must* run more hours per day—*must* give more years of service! That's why *clean air* is vital to your engine operation. Originally engineered to meet the extreme conditions of the dust bowl areas, Cycoil air cleaners not only give outstanding performance under all conditions, but are effective as intake silencers on both engines and compressors.

Engine manufacturers know Cycoil's exclusive 4-way cleaning assures positive dust protection. They will be glad to equip *your* new engines with Cycoil cleaners and you pay only a little more for the best.

Write for facts on how Cycoils save money, keep engines running *perfectly* longer! There is an American Air Filter for every engine and compressor requirement. Send today for full information.

AMERICAN AIR FILTER COMPANY
INCORPORATED

184 Central Ave., Louisville, Ky., U. S. A.

CYCOIL GAS CLEANER

Suitable for practically every gas cleaning problem when temperatures do not exceed 140° F. Operates on same principle as Cycoil Oil Bath Air Cleaner. Ask for Bulletin 130D.



PL-H FILTER
is a complete assembly consisting of housing, ready to bolt to intake pipe, and dry cell type filters in which wool felt constitutes the filter medium. Ask for Bulletin 120D.



TYPE OCH FILTER

Complete assembly consisting of washable viscous impingement type filters. 1, 2, 3, or more cells are used, depending upon size of cleaning job. Ask for Bulletin 120D.



AMERICAN

Cycoil

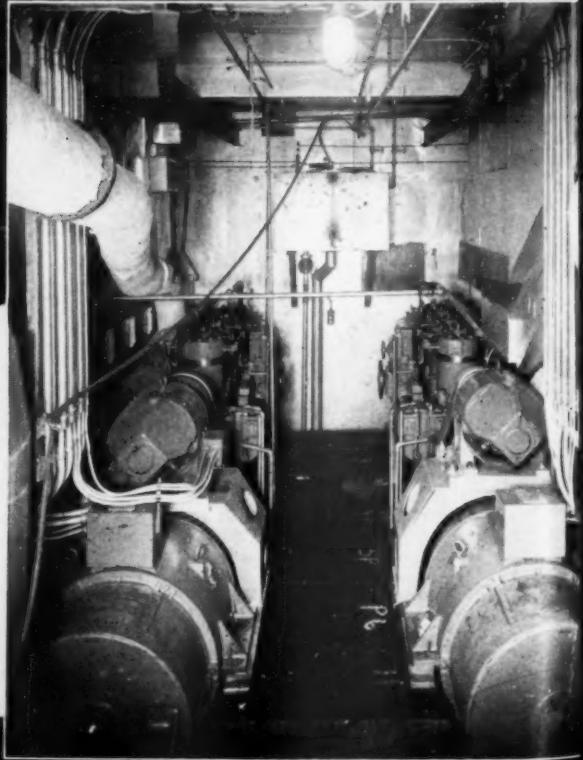
AIR and GAS CLEANERS

"VICTORIA" Is F-M DIESEL POWERED



The "Victoria" has a gross tonnage of 12,500; measures 445 feet in length, with 60-foot breadth; has a loaded draft of 28½ feet.

Auxiliary equipment on the "Victoria" includes these two 4-cylinder Model 35 F-M Marine Diesel generating units, each rated 100-kw. at 400 r.p.m., as well as a 300-kw. port F-M generator and a number of F-M pumps and electric motors. →



FAIRBANKS MORSE



DIESEL ENGINES ELECTRICAL MACHINERY RAILROAD EQUIPMENT WASHERS-IRONERS STOKERS
PUMPS FAIRBANKS SCALES WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

New 445-ft. Tanker, PROPELLED...

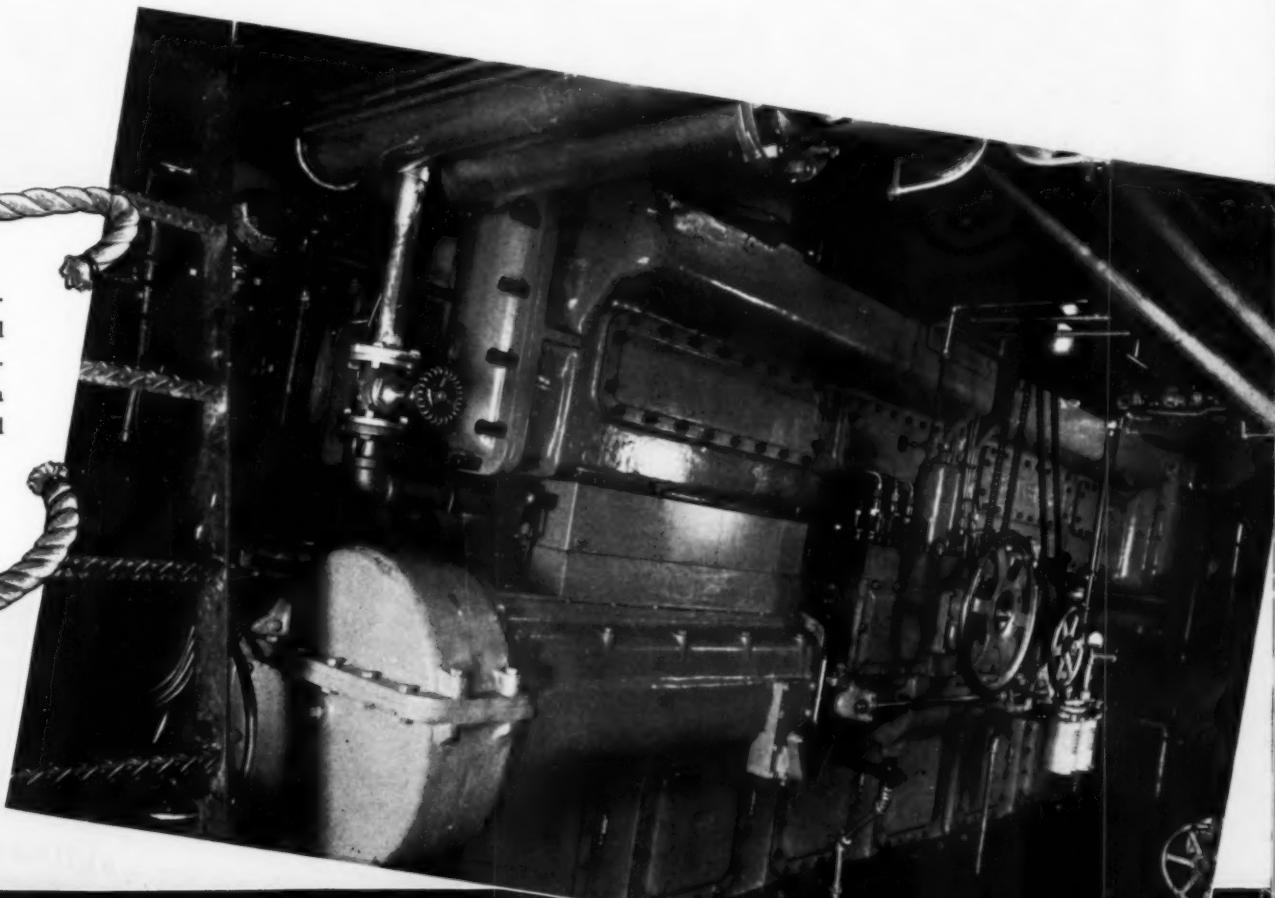
PLYING the seas between North and South America and the Dutch East Indies, the tanker "Victoria" will give her new owners, Compagnia Argentina de Navigacion Mihanovich, Ltda., of Buenos Aires, the economy of *dependable, low-cost power*. For her main engines—and her auxiliaries, too—are of Fairbanks-Morse make. And these Diesels are *built to last*.

Propulsion and auxiliary Diesels are both heavy-duty, low-speed F-M types which have previously *proved* their performance in sustained, heavy-duty service. F-M low-speed design and

heavy-duty construction, plus the simple F-M application of the 2-cycle principle, means less frequent, less costly servicing—a prerequisite to low operating cost. And F-M back-flow scavenging, open head combustion, and differential injection valves contribute to low fuel cost.

You owe it to yourself, before you build or convert, to get the *complete* story of F-M Marine Diesel advantages. Write to Fairbanks, Morse & Co., Dept. L24, 600 S. Michigan Ave., Chicago, Ill. Branches and service in all principal ports.

One of the "Victoria's" two Diesel propulsion engines. Each is a 1050-hp. Model 37 F-M.



Diesels



IT TOOK A BREAKDOWN... TO CONVINCE THEM!



MUNICIPAL AUTHORITIES END POWER PLANT TROUBLES with SOLNUS OILS

For 5 years SOLNUS OILS satisfactorily lubricated the diesel engines in this community's light and power plant.

Then municipal authorities changed to a competitive lubricant. Oil consumption increased 15%... engines became noisy... carbon built up in exhaust ports and behind rings. One night excessive noise developed. It became impossible to balance cylinder temperatures and the engine had to be shut down. But for auxiliary equipment the community would have been plunged into darkness!

They called one of SUN's "Doctors of Industry" and a rush delivery of SOLNUS OIL was arranged. With no mechanical changes made, the engine was started up on SOLNUS OIL and has given trouble-free performance now for 11 months. The authorities were convinced! Now SOLNUS OILS are used exclusively for diesel lubrication.

Help your diesels give peak performance, too. Use these modern oils that are

- WHOLLY DISTILLED
- DURABLE

- NEUTRAL IN ACIDITY
- LOW IN CARBON CONTENT

SUN OIL COMPANY - Philadelphia
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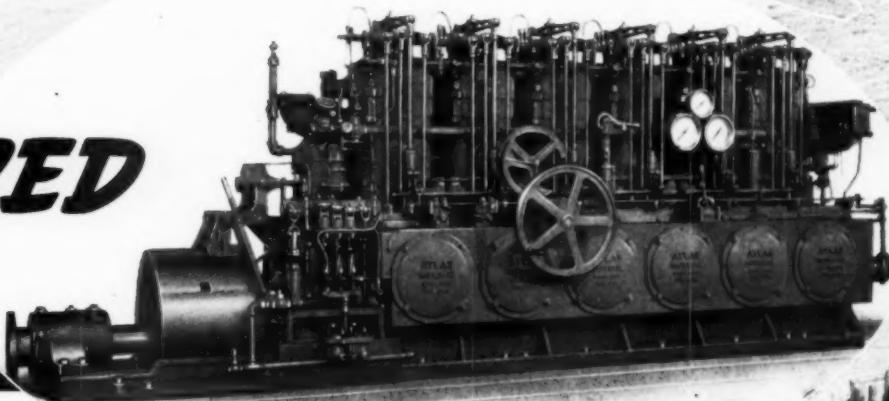
PETROLEUM PRODUCTS FOR ALL INDUSTRIES

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"OL' MAN RIVER"



Has a New
ATLAS POWERED
Packet



THE "NEW MAJESTIC" recently commissioned in a service popularly presumed to be extinct, is owned and operated by the New Orleans-Burwood Packet Co., and is powered by a 220 H.P. Atlas Diesel which swings a 58" x 42" propeller at 335 R.P.M.

This vessel makes one round trip per week between New Orleans and the town of Burwood, 125 miles downstream; as well as to Port Eads and return. She is a common carrier for both freight and passenger service. In cargo she will accept "just anything to be transported," from a sack of oysters to a hundred head of cattle.

The "NEW MAJESTIC" is 86' overall, 22' beam and 6' draft. She was built by the J. D. Covacevich Shipyard at Biloxi, Mississippi and towed to New Orleans, where her Atlas Diesel was installed by Arthur Duvics Sons. She is of all wood construction and will carry on the traditions which are a saga on the Mississippi River.

The "NEW MAJESTIC" is powered by a six-cylinder, direct reversible Atlas Diesel having a bore of 10" and a 13" stroke. It develops 220 H.P. at 335 R.P.M.



ATLAS IMPERIAL DIESEL ENGINE CO.

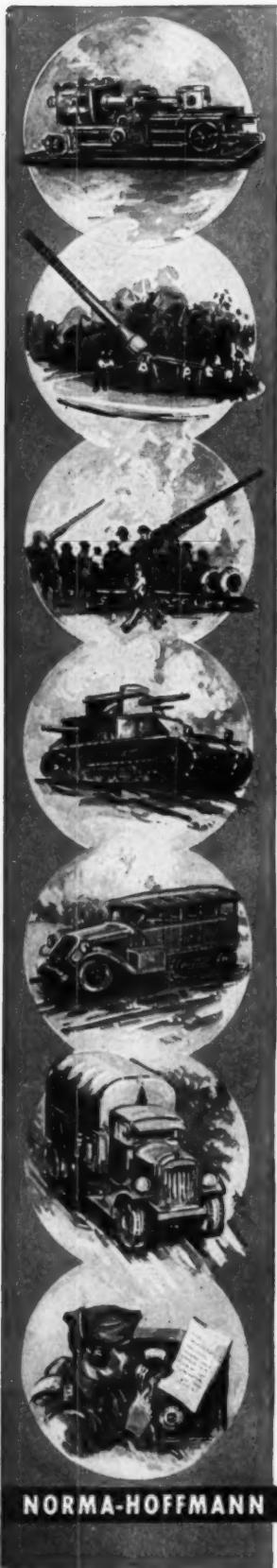
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Day and night, the NORMA-HOFFMANN factory is turning out PRECISION BEARINGS that find their place in the machine tools and machinery producing essential equipment and supplies for army, navy and air forces; in battleships, cruisers, destroyers, submarines, aircraft carriers and other naval craft; in bombers, fighters, scout planes, trainers and transports; in anti-aircraft guns for land and naval operations; in gun mounts, gun-fire control and other ordnance equipment; in tanks and motor transport; and in telegraph, telephone, radio and photographic apparatus.

Submit YOUR bearing problems to us, for study and engineering recommendations—without obligation. Write for the Catalog.



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PRECISION BALL • ROLLER AND THRUST BEARINGS



ALMOST A MILLION CANDLE-POWER IN EVERY BEAM

- To supply the power required for Uncle Sam's 60-inch Anti-Aircraft Searchlights, truck-mounted Power Plants are essential equipment for each Unit.
- Close regulation on these power units is necessarily very critical. The varying of engine-speed is required and is dependent upon "Governors. In addition and is dependent upon the rugged, high-quality field.

To supply the power required for Uncle Sam's searchlights, truck-mounted Power Plants are essential. Voltage regulation on these power units is necessarily very critical. Extremely close governing of engine-speed is required and is dependably attained with Pierce Flyball Governors. In addition to this high degree of control Pierce Governors have the rugged, high-quality construction that has won the confidence of the Pierce organization in the field. The Pierce Flyball Governor can be supplied quickly—a feature that is important in the present emergency.

To supply the power required for Uncle Sam's searchlights, truck-mounted Power Plants are essential equipment. Voltage regulation on these power units is necessarily very critical. This is easily attained with Pierce Flyball Governors. In addition to this high sensitivity of control Pierce Governors have the rugged, high-quality construction that means freedom from service-troubles in the field. The long and specialized experience of the Pierce organization in the design of speed-control devices is always at your call—quickly—and without obligation.

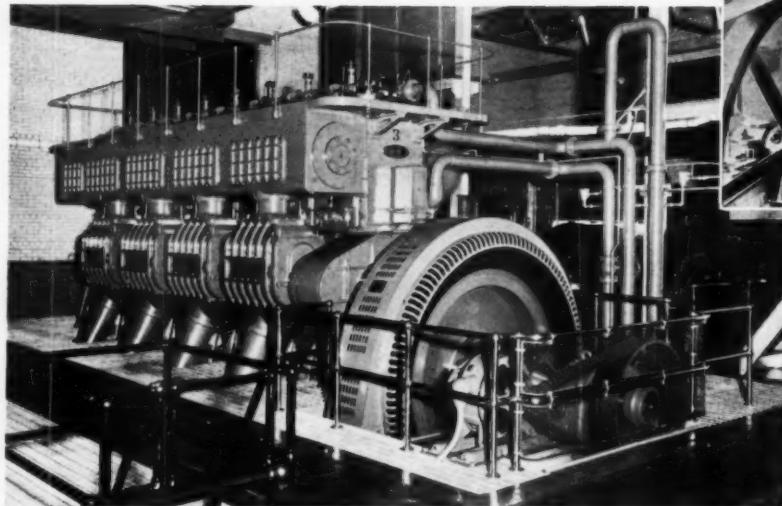
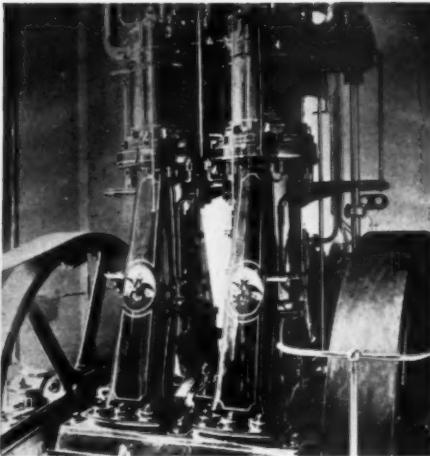
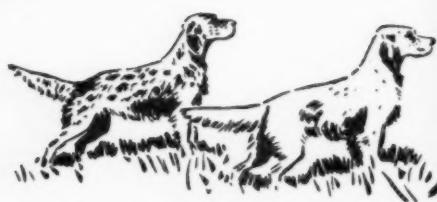
The long and specialized experience of the Pierce Governor Company in the design of speed-control devices is always at your disposal, without obligation.

Pierce Governors are Standard Equipment on the
World's Leading Diesel and Gasoline Engines

THE PIERCE GOVERNOR COMPANY, 1603 OHIO AVENUE, ANDERSON, INDIANA

Pierce Governors

WHY NOT ASK FOR "PAPERS" WHEN YOU CHOOSE A DIESEL, TOO!



Above is the great, great, great Grand-daddy of the modern Busch-Sulzer Diesel—a great engine in its day, attaining achievements that first introduced America to the possibilities of Diesel power. It was this country's first Diesel engine—1898.

Modern, Busch-Sulzer Diesel engine of the trunk piston, single acting, mechanical injection type.

When you buy a good dog you look first for papers. Why not do the same when you buy a Diesel? Ancestry counts. You naturally want to find out all you can about that engine . . . just how much experience goes into its present-day building . . . what has been its record through the years . . . what do others have to say about it.

Right here is the Diesel that has made history in being America's *first* . . . is continuing to make history in always being the *first* to offer you the most

advanced engineering refinements known to Diesel science. Since 1898 it's been Busch-Sulzer . . . first, last and always with hundreds of satisfied owners the country over. Operators who chose Busch-Sulzer first are the same operators who today still point with lasting pride to America's No. 1 engine as their choice. They have found better performance here . . . more dependability . . . with big savings being realized on operating costs. Make yours a Busch-Sulzer, too—and make "it" pay.

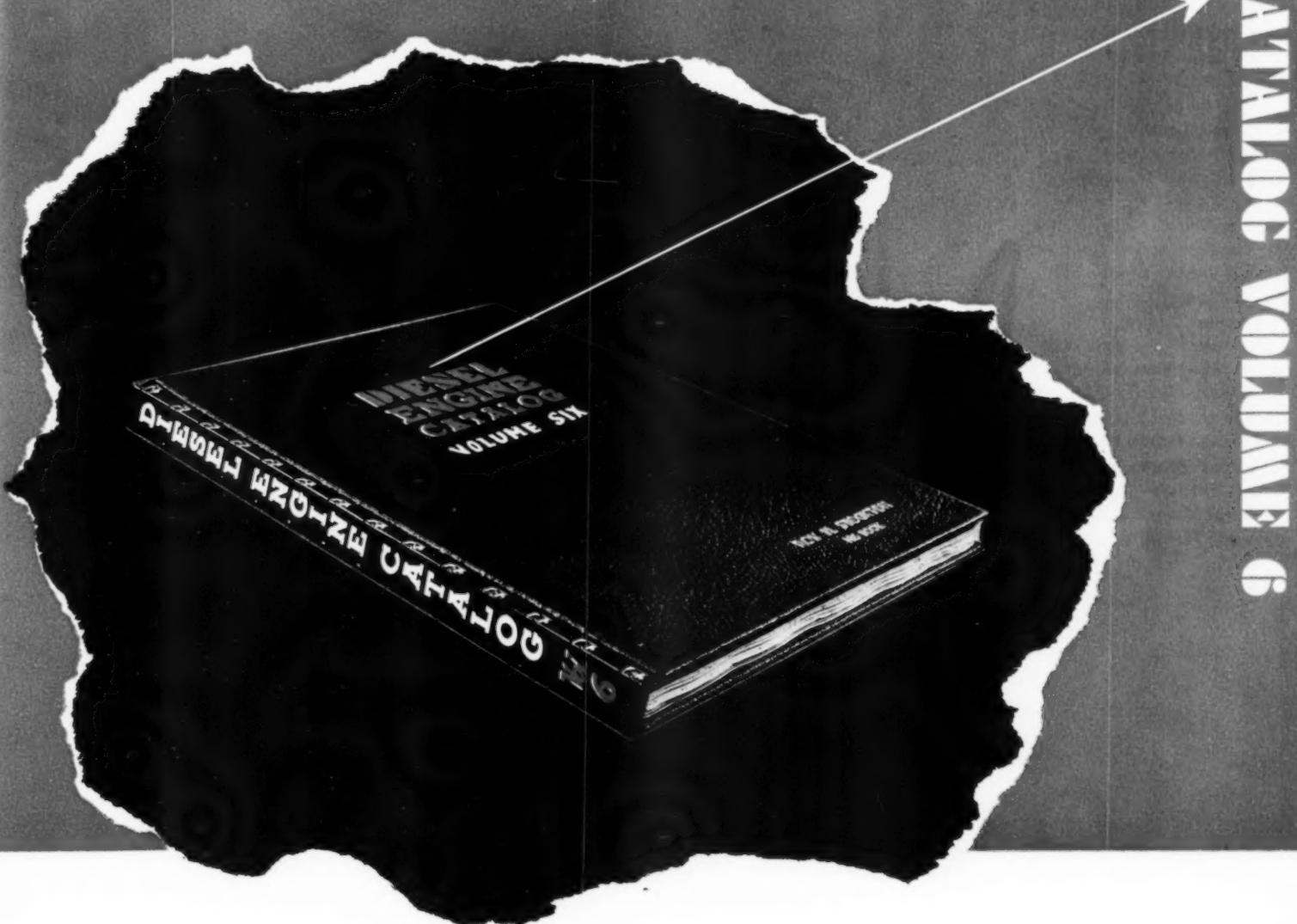
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DIESEL ENGINE



Volume Six of the DIESEL ENGINE CATALOG was ready to mail on August 30th. Completely revised, this book now contains the description and detailed specifications of One Hundred and Forty-Six engines. Nothing like it published. The most useful Diesel book available, containing as it does a complete cross section of this rapidly expanding industry, insofar as the engines available are concerned. Your name imprinted on the front cover for 25c additional if you so order.

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Buda-Lanova Diesels
Busch-Sulzer Bros. 2-cycle
Busch-Sulzer Bros. 4-cycle
Caterpillar Industrial Engines
Caterpillar Marine Engines
Chicago Pneumatic Model 8-CP, and 9-CP
Chicago Pneumatic Type RHB-50
Chicago Pneumatic RHB-100
Clark Bros. Diesels
Cooper-Bessemer Type JS
Cooper-Bessemer Type EN & GN
Cummins Diesels
De La Vergne Type VA
De La Vergne Model VB
De La Vergne Model VG
De La Vergne Model VM
De La Vergne Gas Engines
De La Vergne Model VO
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Enterprise Diesels
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Fairbanks-Morse Model 36
Fairbanks-Morse Model 42
Fairbanks-Morse 32 and 35
Fairbanks-Morse Model 38
Fairbanks-Morse Model 46
Fulton Diesels
General Motors Model 71
General Motors Model 567

Gray Marine Diesels
Hall-Scott "Chieftain"
Hamilton Engines
Hercules Diesels
Hill Diesels
Ingersoll Rand Type "S"
International Diesel Units
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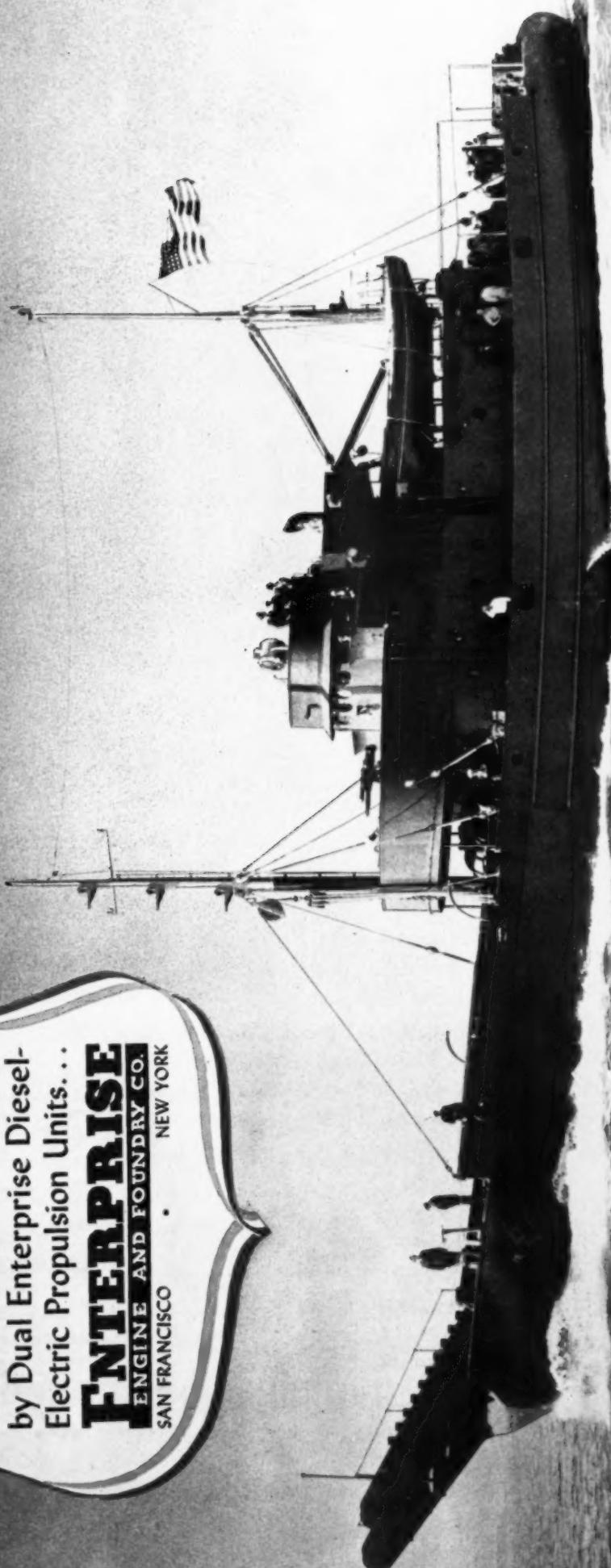
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The Eucalyptus.

One of a fleet of U.S. Navy
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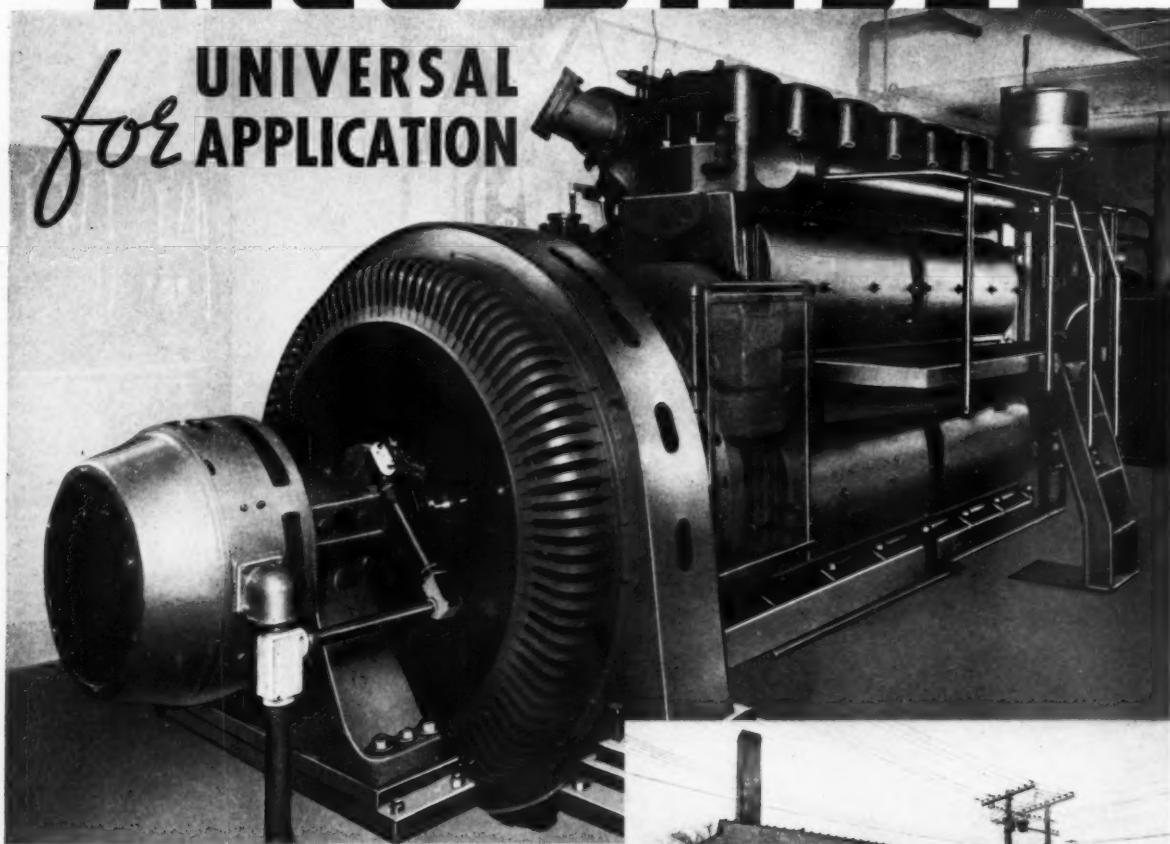
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An Alco, 4-Cycle, 6-Cylinder, Diesel Engine rated at 540 BHP at 660 RPM was recently installed in the Municipal Power Plant of the Village of Skaneateles, N. Y. This Diesel was bought to take care of peaks, and carry the load of the village pumping plant, and all of the essential circuits during high line failures.



This Alco Diesel, due to its exceptional ruggedness, is eminently suitable for heavy duty services. It is in successful operation in Marine, Public Utility, Municipal and Industrial Power Plant Service.



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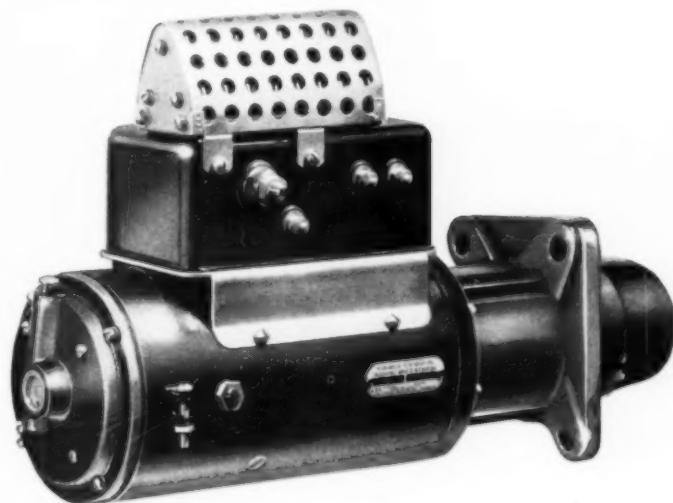
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WE'VE WORKED *27 years* ON YOUR DIESEL CRANKING PROBLEM

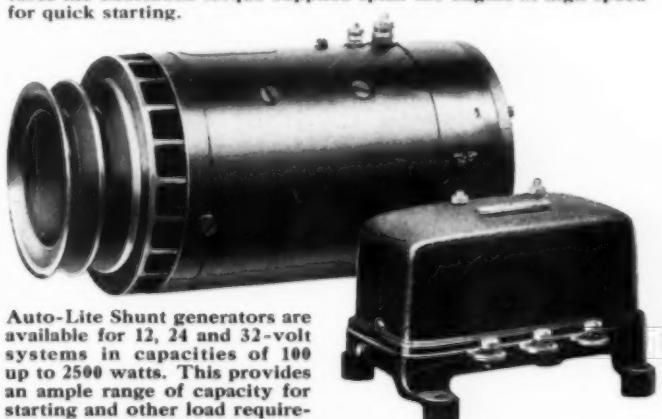
Auto-Lite Starters and Generators for Diesels

AUTO-LITE engineers were among the first to start internal combustion engines electrically. The knowledge and experience they have gained through 27 years in meeting these problems has proved of tremendous value in its application to Diesel Engines. The new Auto-Lite two-step starting motor that meshes on reduced voltage, cranks on full, is a typical improvement that has resulted from this vast fund of practical information. The result is quieter and more efficient operation, longer life to the equipment. Auto-Lite maintains a complete Engineering Research Laboratory. Diesel manufacturers are invited to consult us on problems involving cranking or generating systems.

THE ELECTRIC AUTO-LITE COMPANY • TOLEDO, OHIO
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Auto-Lite starting motors for Diesels operate on two-step voltage. Meshing on reduced voltage greatly reduces the possibility of damage to ring gear, pinion or housing. When teeth are fully meshed, the full voltage is supplied—even at very cold temperatures the enormous torque supplied spins the engine at high speed for quick starting.



Auto-Lite Shunt generators are available for 12, 24 and 32-volt systems in capacities of 100 up to 2500 watts. This provides an ample range of capacity for starting and other load requirements, such as lights and radio. Generators are ventilated by a simple and efficient system.

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Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.

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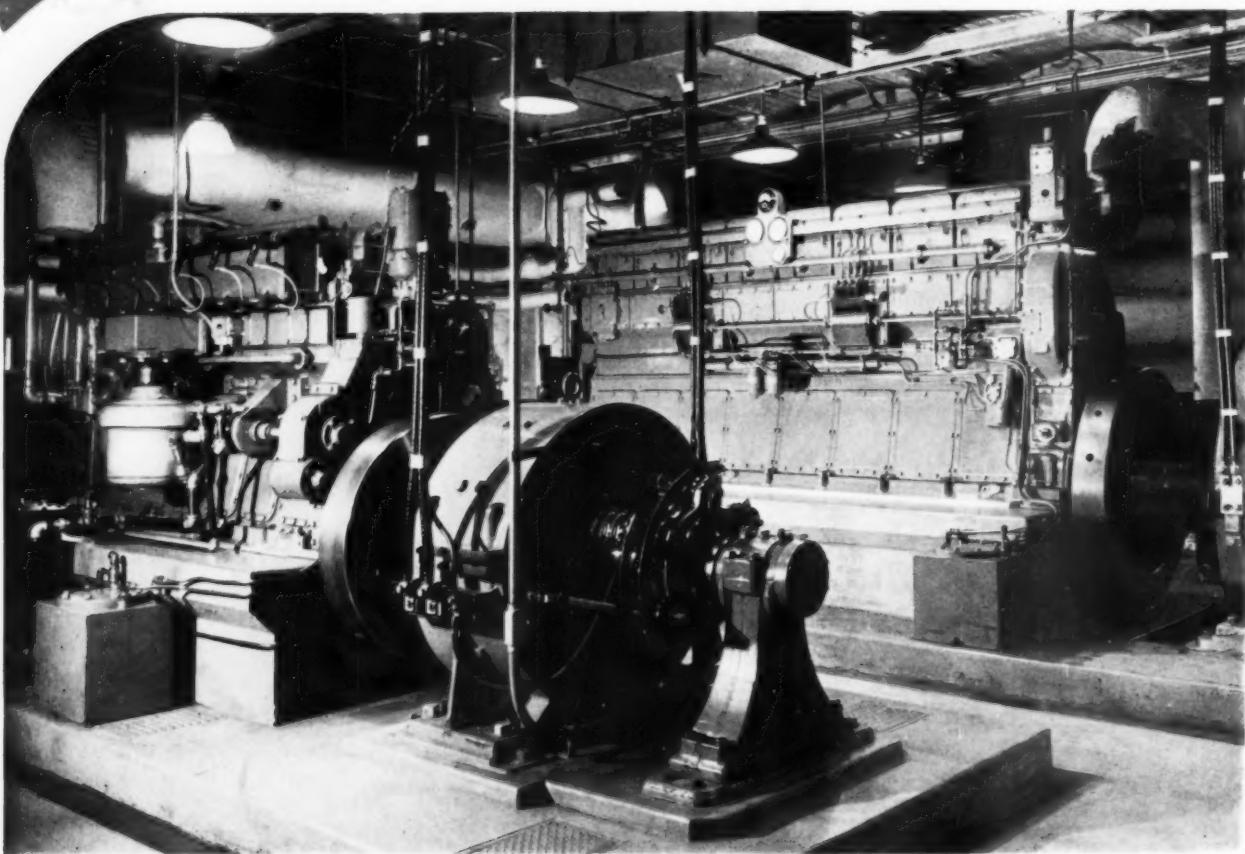
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At the power plant of Wm. R. Warner Company, in New York, two Cooper-Bessemer Diesel Engine generator units have combined with a steam-driven-generator for a team that is producing results.

In one stroke, three old steam engines have been retired, more power obtained, power costs reduced, and dependable standby service secured. Noise limitation was imperative, and noise is noticeably absent. Parallel operation of the steam and diesel units was required, and the team is working together smoothly!

Another example of the adaptability and efficiency of Cooper-Bessemer Diesels!

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